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ROCKS and MINERALS

Vol. 5. No. 2.

JUNE, 1930

Whole No. 16



Courtesy of Thurston M. Phetteplace.
GREENLOW FELDSPAR QUARRY, Mt. Apatite, Maine

SPECIAL MAINE NUMBER

Important Announcement on Page 2
and on back cover

THE MAGAZINE FOR COLLECTORS
2000 Copies Printed This Issue.

THE BULLETIN BOARD

NOMINATIONS OF OFFICERS FOR 1931

Nominations of officers for the Rocks and Minerals Association for 1931 are now in order.

The election, of course, does not occur until the end of the year, but we make this early announcement in order that the members of the Association

may place a nomination of those they would like to see conduct the Association's affairs next year.

Nominations should be sent in on or before July 20th so that they may appear in the September issue of the magazine.

MORE ABOUT A MONTHLY

We are pleased to announce that with this issue we are making another attempt to bring the magazine out monthly and without increasing the subscription price at all. We now have 1548 subscribers and if we can increase this to 5000 our magazine will come out monthly. We are appealing to our subscribers for their interest and assistance and if each will obtain for us at least THREE new subscribers our quota of 5000 will easily be reached. Read the announcement on Advertising page 2, and let us have your pledges RIGHT AWAY. Do not wait to see how the members are voting but DO YOUR SHARE—that is all we are asking of

you. We hope in the September issue to announce that at least 4000 names (regular and pledged subscribers) are on our list.

Interested members desiring to learn how our drive for a monthly is progressing may write in at anytime, enclosing a self-addressed stamped envelope or card, and we will be glad to give them the latest figures.

Just as we went to press we received a letter from E. H. Cienkowski, of Philadelphia, Pa., enclosing SIX new subscriptions for us. This is a good start. Who will be the second to send in his contribution?

OUR SPECIAL MAINE NUMBER

It is a pleasure to put out this issue as a *Special Maine Number* and we are grateful for the interest and co-operation manifested by the Members of the Maine Mineralogical and Geological Society in making this issue a success; the Members unanimously voted to give us their support. Especially are we grateful to Herbert M. W. Haven, President; Leonard Starbird, Secretary; and H. Wallace Noyes, Honorary Member, of the Society, for it is due to their interest and co-operation that this *Special Maine Number* was possible.

We are very sure our readers will enjoy reading the articles contributed by the members of the Society and we are further sure that the series will create pangs of regret in the minds of many that they too cannot be members of an active society or club and thus enjoy the many advantages and pleasures that a society can offer.

We would suggest to our subscribers, and particularly to those residing in large cities or towns, to organize a society of their own which would not only be of special benefit to themselves but might likewise attract the attention of those who may be only slightly interested in minerals and thus start someone else off in this fascinating study.

WANTED: Correspondents in all parts of the world who will be kind enough to send us notes and news items on minerals, etc., that they think may be interesting to the subscribers of ROCKS and MINERALS. Such as are available we shall be very glad to print in the magazine.





ROCKS AND MINERALS

The Magazine for Collectors

Published
Quarterly

Peter Zodac
Editor and Publisher

The Official Journal of The Rocks and Minerals Association

Vol. 5, No. 2

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Changes of address should be sent in at least two weeks before the date of the next issue of ROCKS AND MINERALS, in order to be effective for that number.

ROCKS AND MINERALS

PEEKSKILL, N. Y., U. S. A.

More About a Monthly

Since the March issue came out we have had so many letters from our readers and subscribers expressing keen regret that ROCKS and MINERALS could not come out monthly that we have been induced to reconsider our decision to drop the matter entirely and to give it one more try. We have been influenced to a great extent by the large number of letters from those who either did not vote or else voted against a monthly. Those who did not vote gave as their reason that they did not want to influence us in any way but would abide with the wishes of the subscribers as a whole; those who voted against a monthly are now regretting their decision and wish they had done otherwise. As the matter now stands over one half of our 1500 subscribers are now in favor of a monthly at \$2 per year and no doubt many of our new subscribers would be in favor of this also—but this number is not enough.

On analyzing the matter carefully we come to the conclusion that our efforts failed to make the magazine a monthly due to the following reasons:—

- 1—Too short a notice.
- 2—Lack of co-operation among members and subscribers.
- 3—The desire of many not to influence us in any way.
- 4—Increasing the subscription price.

During the past few weeks we have given this matter considerable attention and study and have also taken it up with our printers to see if some arrangement could not be made to have the magazine come out more often. A large number of suggestions have also been received from our readers which are most timely and encouraging. The most encouraging news was sent us by the printers—if we can have 5000 copies printed every month their rates for these would be so reasonable that we could issue the magazine monthly without increasing the subscription price. JUST THINK!! TWELVE issue of this interesting magazine every year—forty pages per issue—for only ONE DOLLAR!

Here are our plans:—

We now have a little more than 1500 subscribers—1548 to be exact. In order to increase this number to 5,000, each and every subscriber should pledge himself to obtain at least THREE or possibly FOUR new subscribers. If every one does his share our quota will easily be reached and the magazine will come out monthly beginning with the December issue.

It is not necessary to send in any money now. All we want are the pledge coupons filled out and if the total number of subscriptions, pledged and regular, reach 5000, then and not till then, will you be billed.

REMEMBER—this is our third and final attempt to make ROCKS and MINERALS a monthly and if our efforts are not successful we shall drop the matter permanently until such time as we can, on our own initiative, bring the magazine out monthly without appealing to our subscribers for help and co-operation.

Tear off or make duplicate copy of coupon.

Editor, ROCKS and MINERALS,
Peekskill, N. Y.

1930

Of course I am in favor of making ROCKS and MINERALS a monthly at \$1 per year and I pledge myself to obtain..... new subscribers for you so that our quota of 5000 may be reached. When the returns reach the 5000 mark, bill me, and I will remit the amount due within ONE WEEK after receipt of your bill and will also send instructions for the new subscriptions.

THE MAINE MINERALOGICAL AND GEOLOGICAL SOCIETY BIDS YOU WELCOME

HERBERT M. W. HAVEN,
President, Maine Mineralogical and Geological Society.

As President of the Maine Mineralogical and Geological Society, I extend to all Mineralogists and Geologists, and particularly to Members of the Rocks and Minerals Association, a welcome to participate in any of our winter monthly meetings or summer field trips. These winter meetings are held upon the last Thursday of each month, and the field trips, one each month throughout the warmer periods of the year. For further

particulars write our Secretary, Leonard H. Starbird, 265 York Street, Portland, Maine.

We are a cosmopolitan group, some with only a slight knowledge of the higher fundamentals of mineralogy or geology but studying shoulder to shoulder with the more informed, all with a single purpose, and that is, a higher understanding of nature's laws, in reference to its rocks and minerals and geologic formations.

A BRIEF HISTORY OF THE MAINE MINERALOGICAL AND GEOLOGICAL SOCIETY

By LEONARD H. STARBIRD,
Secretary, Maine Mineralogical and Geological Society.

With a desire to promote social intercourse and to disseminate knowledge of Maine minerals, their occurrence, their distribution, and their uses a group of nine men, on January 27, 1927, met at 500 Forest Avenue, Portland, Maine, and organized what was then called The Maine Mineralogical Society. The charter members of this organization were: Herbert M. W. Haven, P. Byron McCord, Dr. W. B. Moulton, William H. Emmons, Arch H. Morrill, Arthur H. Norton, Roy M. Whelden, Charles A. Sawyer, and Bertrand E. Smith.

At the first meeting, P. Byron McCord was elected President and Herbert M. W. Haven was elected Secretary and Treasurer. It was voted to hold the meetings monthly at any convenient place.

At the second meeting it was voted to limit the membership to twenty members, due to the fact that it would be necessary to meet at the residences of various members and a larger number could not be accommodated. Stress was laid upon

the fact that a member need not be an expert on minerals provided he had a liking for the study.

At a following meeting a separation of membership was made into two classes, active and associate. To retain active membership it was necessary to attend all meetings or automatically pass into the associate class.

At these meetings general Society business was discussed, speakers talked about various phases of mining and quarrying and minerals in general, and numerous ideas were presented.

Two summer field trips were taken the first year although others were planned but weather conditions prevented making them. The first trip was taken to the so-called "Maine Desert" in quest of ferruginous sandstone and Indian arrowheads and other relics. The second trip was made with the old amethyst workings on Pleasant Mountain, Denmark, as a destination.

At the December, 1927, meeting, which was the annual meeting, the same officers were reelected to serve for the year 1928.

The monthly meetings for 1928 were carried on in much the same manner as during the previous year and with the close of the year the membership had increased to the limited number of twenty.

During the collecting season of this year six field trips were taken: Mt. Mica at Paris, Dennis Hill at Litchfield, the Winthrop Gold Mine at Winthrop, Phippsburg and Georgetown, Mt. Apatite at Auburn, and the old Winslow Tin Mine at Winslow.

In November, 1928, four of the members were elected to honorary membership: Prof. Edward S. C. Smith of the Department of Geology at Union College, Schenectady, N. Y.; Prof. Freeman F. Burr of the Department of Geology at St. Lawrence University, Canton, N. Y.; Dr. Edward H. Perkins of the Department of Geology at Colby College, Waterville, Maine; and Arthur H. Norton, Curator of the Portland Society of Natural History, Portland, Maine.

At this November meeting steps were taken to form a collection of rocks and minerals for general use. Specimens from the Maine Development Co. at West Pembroke, Maine, were placed in this collection.

At this same meeting the name of the Society was changed to The Maine Mineralogical and Geological Society; work of indexing the Maine minerals by towns was begun; and a Historian was appointed to care for clippings about minerals and geology and other items.

In December, 1928, the following officers were elected: President, P. Byron McCord; First Vice-President, William H. Emmons; Second Vice-President, Christian M. Jurgenson; Secretary, Herbert M. W. Haven; and Treasurer, Charles M. Mower.

H. Wallace Noyes, an active collector and a member, promised to present to the Society his large and very fine collection of minerals, provided suitable housing could be obtained.

At this same December meeting, the formation of a State Geological Survey was discussed and a proposed bill to establish this was read. The Society voted to sponsor action in this direction.

At the May, 1929 meeting, the Society voted to have unlimited membership, thereby eliminating the associate class of members.

During the collecting season of 1929 trips were taken to the following places: the giant beryl crystals at Albany, Maine(1); a limonite deposit at North Shapleigh; an old lead mine at Kezar Falls; to Cornish, Porter, and Parsonfield; to the granite quarry at Fryeburg and to the granite quarry at Redstone, New Hampshire; and to the Wyman Dam at Bingham.

At the November meeting, Christian M. Jurgenson, formerly a mining engineer, offered to loan the Society a blast furnace, a rock breaking table, and scales, for assay work. Steps were taken and the work is now nearing completion of preparing a room where they may be used.

A contest sponsored by H. Wallace Noyes for the study of minerals, with mineral specimens as prizes, was announced and a series of special meetings was set aside for this work.

At the annual (December) meeting for 1929 the following officers were elected: President, Herbert M. W. Haven; First Vice-President, Roy M. Whelden; Second Vice-President, Edward H. Leonard; Secretary, Leonard H. Starbird; and Treasurer, Charles M. Mower.

At the January, 1930 meeting a series of what has been termed "opening exercises," based upon the study of some phase of mineralogy or geology was introduced. All members are called upon to participate in these exercises.

At this meeting, William H. Emmons, Teacher of Earth Sciences at Deering High School, Portland, introduced a series of talks on geology. He illustrated his talks with lantern slides. Stanley I. Perham, owner of the Maine Mineral Store, West Paris, discussed the possibility of housing the giant beryl crystals at Albany, Me.

At the February meeting, Dr. W. B. Moulton, the host, showed the Society microscopic slides of Maine tourmalines under polarized light. The geology talks by William H. Emmons were continued. The Field Trip Committee announced that the first 1930 trip would be taken to the islands in Casco Bay, probably some time in May.

At the March meeting, Dr. Edward H. Perkins of Colby College, preparing the members for their collecting season, dem-

(1)—See Sept. 1929 issue—ROCKS AND MINERALS, Vol. 4, No. 3—"Huge Beryl Crystals at Albany, Me." by E. K. Gedney and Harry Berman.

MEMBERS OF THE MAINE MINERALOGICAL AND GEOLOGICAL SURVEY.—Courtesy of H. Wallace Noyes.



In the group are, front row, left to right— Watt, Christian M. Jurgenson, William H. Comber 26, 1929, at the home of H. Wallace Edmond P. Skillin, Carroll L. Skillin, Dr. W. B. Moulton, Leonard H. Noyes, West Street. The following officers for T. Miller, Roy M. Whelden, P. Byron Starbird, Kenneth E. Chick, Philip C. Foster, the ensuing year were elected: President, Herbert M. W. Haven; first vice president, Edward H. Leonard; second vice president, Roy M. Whelden; secretary, Leonard H. Ward H. Leonard; treasurer, Charles M. Mower. The picture was taken at the annual meeting of the Maine Mineralogical and Geological Society which was held on Thursday, December 26, 1929, at the home of H. Wallace Noyes. Middle row—Raoul F. Levesque, Isaac Skillin, H. Wallace Noyes and Herbert McCord. Back row, Standing—Howard C. Reiche, Thurston E. Smith, Charles M. Mower, Donald T. Strand, Everett C. Smith, Leonard H. Leonard, Bernard L. Moxey, Bert M. W. Haven.

onstrated blowpipe tests of various minerals. The host, H. Wallace Myers, displayed choice specimens from his collection.

On March 25, 1930, seven cut semi-precious stones, the gift of Stanley L. Perham, were added to the collection of the Society.

Two names have been added to the list of honorary members. They are Dr. W. B. Moulton and H. Wallace Noyes.

At the present time a library, with many interesting books and pamphlets, is being accumulated. Dr. W. B. Moulton recently added a set of U. S. Geological Survey volumes to this.

The membership consists of thirty-six regular members and six honorary members. Plans are outlined to increase this membership.

The following is a list of members and their occupations.

HONORARY MEMBERS

Prof. Freeman F. Burr, Geologist, Dept. of Geology, St. Lawrence Univ.

Arthur H. Norton, Curator, Portland Society of Natural History.

H. Wallace Noyes, Retired. Former Chief Chemist, A. S. Hinds & Co.

Dr. W. B. Moulton, M. D. and Eye Spec.

Dr. Edward H. Perkins, Asst. State Geologist, Dept. of Geology, Colby College.

Prof. Edward S. C. Smith, Geologist, Dept. of Geology, Union College.

REGULAR MEMBERS

Carroll L. Bean, Chemistry Teacher, Deering High School.

George S. Beach, Employee, Chair Manufacturing.

Kenneth E. Chick, Candymaker's Helper. **Orrin D. Chick,** U. S. Railway Mail Ser.

Linwood Cross, Manufacturing Jeweler.

Wm. H. Cross, Manufacturing Jeweler.

Capt. William H. Emmons, Teacher of Earth Sciences, Deering High School.

Philip C. Foster, Manager, Portland Directory Service.

Herbert M. W. Haven, Manufacturing Confectioner.

W. B. Hill, Industrial Agent, Bangor and Arroostook R. R.

Christian M. Jurgenson, Former Mining Engineer, Wholesale Bakery.

Martin L. Keith, Lapidary and Jewelry.

Edward H. Leonard, Architectural Wood Worker.

Raoul Levesque, Grocery Clerk.

John W. Lucas, Retail Coal Dealer.

Capt. P. Byron McCord, Adj't., Coast Artillery and Musician.

Clifford E. McGlaunlin, Attorney.

Henry W. Merrill, Blacksmith and Architectural Ironworker.

Prof. L. H. Merrill, State Geologist, Dept. of Geology, Univ. of Maine.

Clayton T. Miller, Automobile Mechanic.

Charles M. Mower, Supt. of Building Construction.

Bernard L. Moxeey, Student.

Roy E. Peaslee, Shipper, Wholesale Grocery Business.

Lendall D. Osgood, Retired Grocer.

Thurston M. Phetteplace, Student, Brown University.

Stanley I. Perham, Owner, Maine Mineral Store.

Howard C. Reiche, Teacher of Geography, Portland High School.

Charles A. Sawyer, Master Mechanic, American Can Company.

Bertrand E. Smith, U. S. Game Protector.

Everett C. Smith, Electric Car Operator.

Leonard H. Starbird, Asst. Foreman, Portland Terminal R. R. Co.

Albert F. Stuart, M. D., Immigration Examiner.

Isaac Skillin, Paper Box Manufacturer.

Charles S. Towle, Wholesale Fruit Dealer.

Almon R. Warren, Office Supply Salesman.

Donald T. Watt, Cabinet Maker.

Roy M. Whelden, Headmaster, Portland Country Day School.

LITCHFIELDITE

By HERBERT M. W. HAVEN,
President, Maine Mineralogical and Geological Society.

At times one's interest centers on some special mineral locality, not due to the abundant of species but to the sort of joy experienced in anticipation of finding better specimens. With this in view, I have pounded many a rock, as well as my fingers, in the little towns of Litchfield and West Gardiner, Maine.

Litchfield and West Gardiner, Maine, are located in the southeast corner of Kennebec County and are well known localities for canerinitite and sodalite.

Such pioneers as W. M. Bailey of Colby College, Prof. R. A. Daley of Harvard University, Dr. Edward H. Perkins of Colby College, Prof. Edward S. C. Smith of Union College, F. W. Clark of the U. S. Geological Survey and Thomas F. Lamb of Portland, Maine, have prospect-

ed and studied the geology and the rocks and minerals from this locality.

The rock at Litchfield and West Gardiner is a syenite rich in nephaelite so would be classified as a nephaelite-syenite. It also carries several rare minerals such as—sodalite, a blue mineral; canerinitite, a yellow mineral; lepidomelane, an iron mica; and hydronephelite, a massive white alteration product belonging to the zeolite family. This combination is found nowhere else, so this special type of rock has been called litchfieldite. In addition to the above minerals may be added albite and zircon.

Canerinitite seems to run in three color phases; a bright orange-yellow with strong luster and cleavage, transparent in thin fragments; a dirty pale yellow, less



Photo, by Arthur H. Norton.

Litchfieldite Boulders on Dennis Hill, Litchfield, Me.

lustrous, highly cleavable, also transparent in thin fragments; and a bright yellow, a granular variety.

Sodalite is occasionally found but is rather rare. I have seen specimens coming from this locality which showed more as a coating on the nephelite-syenite. Also I have found specimens of this mineral throughout sections of the nephelite-syenite with the blue color manifested in a bleached condition, the spots being of the size of a ten penny nail head or smaller.

I have cabochons in my collection which have been cut from both cancrinite and sodalite.

The nephelite syenite boulders are found in various places throughout these two towns. One of the principal localities is Dennis Hill, in Litchfield, an elevation of approximately a little over 400 feet. As far as is known, the only ledges are two small dikes; one in the road just north of Spear's Corner; and the other on the west side of the road about half-way up the first hill south of Spear's Corner, both dikes being in the Town of West Gardiner. Last fall new road work had covered the first locality, but fresh material could be found beside the road.

At places in this section are dikes of a soda-syenite which may be related to the nephelite-syenite. Probably all the boulders came from small dikes now buried in the glacial till. The rock into which the dikes are intruded is a mica schist.

A series of hills, of which the litchfieldite appears to be the end member, are composed of syenites (rocks rich in feldspar but with no quartz) of varying compositions but differing in the minor minerals from each other. The Litchfield occurrence is the only one known which contains both sodalite and cancrinite. The more important members of the series, starting in Maine, are as follows: Dennis Hill at Litchfield, Hedgehog Hill at Wayne, Burnt Meadow Mountain at Denmark and Pleasant Mountain at Denmark; in New Hampshire, Red Hill and Mount Belknap near Lake Winnipesaukee, Mount Tripyramid near Waterville, Pawtuckaway Mountain at Deerfield, Stark's Mountain at Stark; in Vermont, Mount Monadnock; and in Canada, Mounts Brome, Gale, Shefford, Yamasaka, Rougemont, St. Hilarie, St. Bruno in Quebec and Mount Royal in the City of Montreal. In addition to the above, at



Photo. by Prof. Edward S. C. Smith of Union College.

Maine Mineralogical and Geological Society's Field Trip to Dennis Hill, Litchfield, Maine, June 27, 1928. On top of rock, Dr. Edward H. Perkins; leaning against rock, left to right—G. W. Toppan, of Newburyport, Mass.; H. M. W. Haven, William H. Emmons; kneeling, left to right—Arthur H. Whitman, Almon R. Warren, Howard C. Reiche, Leonard H. Starbird.

York, Maine, Mount Agamenticus, is composed of three hills of ordinary syenite, and at Alfred there is a plug of ordinary syenite.

W. M. Bailey, formerly of Colby College, calls the nephelite-syenite Pre-Cambrian. Most of the hills have not been worked in detail, and the rocks have not been given distinctive names as is the case of Litchfield. Mount Royal has been studied and the rock is a type of syenite

known as essexite (from Essex County, Massachusetts) where this rock is also found.

Fine specimens of the minerals from Litchfield and West Gardiner, Maine, are found in the various museums and private collections throughout the United States. On a recent trip to San Francisco I noticed them on display in the collection of the Bureau of Mines of California.

DIATOMACEOUS EARTH OR DIATOMITE

By ROY M. WHELDEN,

First Vice-President, Maine Mineralogical and Geological Society.

Diatomaceous earth is known to occur in widely scattered areas the world around. Wherever water can stay sufficiently quiet to meet the demands of diatom life to enable the empty testa to accumulate to a considerable thickness, there in time will be found diatomaceous earth.

In times past and probably present, Maine has offered many such favorable localities. Thickly scattered as are its ponds and lakes, and quiet as many are, diatoms find abundant habitats suitable for their growth. And under many of the bodies of water are found diatomaceous earth.

A few of these deposits are known. Probably many more exist, if similarity of locality furnishes any criterion for prophecy.

A few of the known localities are commercially operated. Particularly, the deposits in Beddington and in the neighboring town of Cherryfield and another in Cornish. Others have been operated in other towns from time to time in the past. The first two mentioned were worked to obtain material which was sold to the metal polish trade. The material was burned before being shipped from the region where it occurred. The burned diatomite was very white. The Cornish material is manufactured into a cleanser for automobiles and a preparation for washing windows.

All localities in which the material occurs are similar in appearance. The Cornish locality may be taken as typical.

Here one sees a shallow pond, probably not over five feet deep in any part, judging by the numerous water plants growing in it. The shores of the pond are extensive, flat and boggy, covered with marsh plants offering a springy but unsafe footing, some 200 to 400 feet in width. The pond bottom is a thick, soft brown ooze.

There are probably many other diatomite localities, as is frequently suspected. Doubtless, the many "Chalk Ponds" in Maine bear witness of the abundance of ponds underlain by white earthy material of diatomaceous earth.

Many of these (and other) ponds when studied fail to show true diatomite. Frequently the soil is a fine white sand. Sometimes scattered fragments of diatom testa are observed. Again large quantities of diatom fossils are noted.

No exhaustive study of the species of diatoms composing the Maine earths has been made. A casual glance with the low power of a microscope will reveal many species perfect in form. The Cornish station is interesting because the diatomite is composed to a great extent only of the crushed testa of the plants. A fertile field for fruitful study is open to any student who will undertake it.

It is interesting to note that the freshwater ponds of the state are frequently devoid, or nearly so, of living diatoms, even in ponds over a thick diatom deposit. Quite probably these plants, like many other freshwater algae, are periodic in their life cycle and flourish only at special periods.

THE GLACIAL PERIOD IN MAINE

By DR. EDWARD H. PERKINS,
Honorary Member, Maine Mineralogical and Geological Society.

(*A contribution from the Department of Geology, Colby College.*)

The last important event which helped shape the surface of the State of Maine was the coming and going of a great mantle of ice. This, although it had no marked effect on the general topography of the region, altered the details in many ways and its effects are of great importance to man.

Previous to the advance of the glacier, Maine had for tens of thousands of years been undergoing intermittent uplift, each upward movement being followed by periods of quiet when marine and river erosion carved plains whose traces still show in the level skylines of the state. As a result of these movements the land at last stood considerably above the present level. This is proved by the hills and valleys now submerged beneath the Gulf of Maine and by buried gorges whose bottoms are not lower than the level of the sea but which at the time of their formation must have been beds of streams flowing down to the ocean.

The coming of the ice was ushered in by a gradual cooling of the climate. Each winter the snow came a little earlier and stayed a little later. Cold water forms of life appeared along the coast while northern animals roamed over the land. The forests disappeared and were succeeded by a tundra upon which fed herds of reindeer and musk-oxen. Valley glaciers appeared in the mountains carrying cirques of which the "gulfs" and "ravines" of the White Mountains and the "basins" of Katahdin are good examples. Finally the glacier crept over the state until the front passed out into the region now covered by the sea and the highest mountains were buried. During the early stages of the advance, the glacier moved toward the southeast, but in the later stages the movement was nearly south. This is shown by the glaciated ledges where striae averaging N 60°W are crossed by younger striae averaging N 10°W. Some geologists believe that Maine was

covered by two glaciers, the older one being the one which topped the highest mountains while the later one was thinner and did not reach much above 2000 feet on the mountain sides. If this be true the two sets of striae may represent the two glaciers instead of two movements in one glacier.

After hundreds and probably thousands of years the climate moderated and with the increased warmth the ice wast ed away. At this time the high lands to the north served as an effectual barrier to the thrust from Labrador and the ice over the greater part of Maine became stagnant. This mass of dead ice melted in place from all sides and from the top downward. The weight of the glacier had depressed the land so that it stood several hundred feet below its present level. The melting of the ice all over the world also caused the sea to rise so that the front of the glacier was washed by the waves as it retreated northward. Streams of melted water poured through crevasses and tunnels in the ice depositing the gravel which form the eskers so characteristic of Maine. Where these streams flowed into the sea deltas were built whose upper surfaces mark the elevation of the ocean surface at the time of their formation. Where the ice front rested on land, wash plains of fine gravel and sand were spread out dotted by stranded bergs whose melting formed kettle holes. At other places jumbled masses of gravel and ice were formed now represented by a rough kame and kettle topography.

As the ice receded and the sea followed until the southern and eastern parts of the state were covered. In this sea clay and sands were deposited mantling the glacial deposits and bedrock alike. Where conditions favored, these deposits contain the record of an abundant sea life similar to that found today from the coast of Maine northward to arctic regions. Some time after the arrival of this fauna, there seems to have been a

revival of movement in the glacier with a readvance which caused the formation of eskers on top of the marine clays.

Finally the ice receded over the front of the Moosehead Plateau. Here it probably lingered for sometime after the lowlands were uncovered. As it melted fresh water lakes were formed of which Greater Moosehead Lake and Glacial Lake Bigelow are good examples. In time these lakes were filled in or partly drained; the former being represented by the present Moosehead and Brassua Lakes and the latter by the broad valley of the Dead River back of Mount Bigelow.

With the removal of the great weight of the glacier from Maine the land slowly rose, the uplift being greatest where the load had been the greatest. The result was a tilt of the land so that the post-glacial shorelines are now about 200 feet above the sea in York County and 500 feet above sea level in the upper Kennebec Valley. The land has not yet entirely recovered and strains are set up in the rocks, which, when the elastic limit is reached, snap, thus causing our present series of earthquakes.

The most interesting deposits left by the great glacier are the "horsebacks" or eskers mentioned above. These occur as ridges varying from a fraction of a mile up to nearly 200 miles in length and from a few feet to about 100 feet in height. Excavation shows that they are composed of coarsely stratified gravels of varying degrees of coarseness with a mixture of rounded water worn pebbles and angular glaciated pebbles. These ridges were probably formed by subglacial streams flowing in the stagnant ice. Where these streams poured from the ice front into the sea, deltas were built. Often a series of these deltas were formed along the esker recording halts in

the recession of the ice front as recessional moraines do in the interior of the continent. In the long eskers it is probable that no great length of tunnel was open at any time but that it was built back with the recession of the ice front and the headward erosion and melting of the subglacial stream. Thus parts of a single long ridge may vary greatly in age. Finland is the only other part of the world which compares with Maine in its wonderful development of eskers.

Before the glacial period there were probably few if any lakes in the state. The drainage was adjusted to the rock structures; the majority of the streams following the valleys carved in the weaker rocks with here and there a major stream superimposed over a resistant formation. The master stream flowed into the ocean off the present continental shelf. The retreat of the ice and sea from the present area of the state left the drainage in a disorganized condition. The old valleys were filled by glacial deposits so the courses of the new streams were determined by the irregularities of the surface deposits rather than by bed rock beneath. The result was the development of hundreds of lakes in kettle basins, and behind dams of glacial material and of waterfalls where the streams were superimposed over buried ridges. Thus the beautiful lake scenery and the water power of the state are due directly to the glacial period.

The foregoing is a summary of our present knowledge of the great ice age in Maine. Much work yet remains to be done and this may lead to a revision of the views outlined above. Road construction is all the time uncovering new material and the final chapter on the glacier period in Maine is yet to be written.

Though we have tried to improve each issue of the magazine, we doubt if we have ever offered such good inducements as we are now making—a monthly magazine for \$1. Even if a subscriber was to pay out of his own pocket for the three subscriptions we ask (see announcement on Advertising Page 2) he would not be losing anything for at our regular rate a monthly should cost \$3.00.

It is with sincere regret we have to announce the passing away of Loren B. Merrill, who recently died, after a week's illness, at his home at Paris Hill, Maine.

Mr. Merrill was prominent in Maine mining circles. He operated the famous Mount Mica mine, near Paris Hill, for many years as well as other noted mines. He was also a noted lapidary and an expert on gems.

THE LAVA FLOWS OF NORTHERN MAINE

By PROFESSOR EDWARD S. C. SMITH, Union College,
Honorary Member, Maine Mineralogical and Geological Society.

If we could look back an immense distance in time, long before the great ice age, even before the continent of North America had attained its present configuration, we might be somewhat surprised at the sight that would greet us in northern Maine. We would find this part of our State the seat of intense volcanic activity. In Aroostook, Penobscot, Piscataquis and Somerset Counties volcanoes were pouring forth their hot lavas with all of the usual accompanying phenomena of mud flows, ash deposits and the like, and without doubt large volcanic mountains were built up out of part of the lava and general ejectments.

While such volcanic mountains no longer exist, due to the fact that if they ever were produced, the succeeding erosion throughout millions of years have destroyed them, there are many square miles of lava left, mutely testifying to the vulcanism which once took place.

These volcanoes apparently were in activity along a roughly north-east, south-west line, following the trend lines of the major structural folds into which the rocks of northern Maine have been thrown by strong crustal movements.

The first lavas to be accurately described are those which lie between Presque Isle and Ashland in Aroostook County. The area was mapped by Professor H. E. Gregory¹ and includes many square miles of rhyolites, trachytes and andesites.

Passing on to the south-west we next reach the Traveller Mountains in Penobscot and Piscataquis Counties, described by the present writer², which consist of a series of flows and hypabyssal rocks covering an area of some fifty square miles and by their superior resistivity to the agents of weathering form a rugged mountain mass.

Again continuing south-west we come to the Lobster Mountains which consist of brecciated material and quartz porphyry, while beyond them is the Kineo range of rhyolite hills also described by the writer³ which extend south-west for sixteen miles. Still farther on are more rhyolite hills and mountains not yet described.

Mineralogically and chemically these lavas all show a striking similarity as do also their modes of occurrence, and it is believed that they represent a single epoch of vulcanism along a structural line of weakness and which occurred in the latter part of the Paleozoic Era.

- (1) Williams, H. S. and Gregory, H. E. "Contributions to the Geology of Maine," U. S. Geological Survey Bulletin No. 165, 1900.
- (2) Smith, E. S. C. "The Geology of the Katahdin Area, Part I, A New Rhyolite from the State of Maine," American Journal of Science, Vol. XIX, Jan. 1930.
- (3) Smith, E. S. C. "The Igneous Rock of Mt. Kineo and Vicinity," American Journal of Science, Vol. X, Nov. 1925.

AN INTERESTING QUARRY

By EVERETT C. SMITH,
Member, Maine Mineralogical and Geological Society.

The Municipal quarry at Portland, Maine, yields a fine variety of minerals interesting to collectors.

The Quarry is situated on the east side of Read street, in the Woodfords section. The rock is a coarse granite. A crusher is in operation nearly six months in the year; the crushed product is used for highway construction.

Specimens of the following minerals

may be obtained at this location: Radiated black tourmaline, arsenopyrite, and iron pyrite.

At the westerly end of the quarry a so-called "gas funnel" was found. This is a fault zone where the rock has been crushed. Specimens of slakensides, due to the faulting, may be found here. Along the faulting zone, epidote, developed by pressure, may be found.

A FIELD TRIP OF THE MAINE MINERALOGICAL AND GEOLOGICAL SOCIETY TO THE WYMAN DAM AT BINGHAM, MAINE

BY CHARLES M. MOWER,
Treasurer, Maine Mineralogical and Geological Society.

On October 6, 1929, a party of fifteen members and guests of the Society left in the early morning for a trip to Bingham to examine the rock formations where blasting was being carried on for the Wyman Dam. We were joined at Waterville by Dr. Edward H. Perkins, of Colby College, a member of the Society, and three guests. To a lover of nature the ride was one long panorama of beauty as we rode along through the valleys and over hills where the wooded slopes reflected a beauty of coloring in all tints and shades of red and gold which only the Master of Nature can produce.

En route we stopped at the deposit of hornblende at Greene, Maine, on the state highway while several of the members obtained specimens.

Arriving at the scene of operations on the Wyman Dam about 11 A. M., we became the guests of Central Maine Power Company, through the courtesy of Engineer G. E. Haggas of the Cumberland County Power and Light Co., who arranged for our passes and for a sumptuous dinner at the Company Mess Hall.

After dinner we were furnished with a guide who escorted us over the whole operations, explaining the difficulties of caisson work, and giving us a very good general idea of the whole gigantic plan of construction.

Dr. Perkins called our attention to epidote, which was in glacial drift pebbles, also to a camptonite dike, which is a basic igneous lava containing hornblende crystals. This is the first camptonite dike found in the State of Maine. (it was first discovered at Campton, N. H.) Crystals of staurolite were also noted and a quartzite (which is a metamorphic sandstone) containing pyrites.

A mass of pyrrhotite and chalcopyrite was shown us by a fireman on duty. This came from a recent blasting.

Dr. Perkins also showed us a graphitic shale, a coating of limonite on quartzite and a plagioclase feldspar in a large diorite glacial boulder.

The following is Dr. Perkins' report to the Society:

"The Wyman Dam is built in gravels which were deposited as an esker under the glacier as it melted from the valley. The old pre glacial valley was filled by these gravels to the depth of 250 feet at the deepest point. The dam has been built through these gravels by means of caissons which are keyed into the bedrock below.

The bedrock is a dark blue quartzite which has been subjected to considerable pressure. The bedding has been nearly destroyed but appears to be in gentle anticlines and synclines. The pressure has caused the development of vertical cleavage which gives the appearance of bedding and has led to the false conclusion that the bedding is vertical. The fact that the beds have been subjected to such intense metamorphism leads me to believe that they are very old, probably Precambrian, since the development of the cleavage, pyrite has been deposited along the cleavage planes forming yellow lenses which show strikingly against the dark blue background of the quartzite.

The only sign of igneous intrusion noted was a camptonite dike, on the west side of the river. Camptonite is a basic igneous rock which is quite common in the White Mountains (the name comes from Campton, N. H.) but as far as either Arthur Keith or I know, has never been found in Maine."

The party arrived home about midnight, having covered approximately 270 miles, feeling that the day had been well spent and having obtained several interesting specimens and much valuable information.

THE GOLD RUSH TO SWIFT RIVER

By CLAYTON T. MILLER,
Member, Maine Mineralogical and Geological Society.

A party, consisting of Edward H. Leonard, Roy M. Whelden, Leonard H. Starbird, and Clayton T. Miller, left Portland at 6:15 A. M., Nov. 9th, 1929, for the Swift River at Houghton, Me. The weather was fine, but at Canton we encountered $\frac{1}{2}$ inch of snow. We arrived at Rumford at about 8:30 A. M. The sun was well up and the snow melting. After crossing the Maine Central Railroad ten times, from Byron to Houghton, we arrived at Houghton about 10:30 A. M. Making several inquiries as to the locality desired, we then headed in on an old wood road to the Gold Mine. This road, following the bank of the Houghton branch of Swift River, we traveled for about one mile.

All hands assisted at pitching tents and making general preparations for business of game and gold hunting. After a hasty noon-day meal, Whelden and Leonard tended camp while Starbird and Miller, with their trusty guns, fared forth to explore the country and bring in the game. Following up the course of the river about one-half mile from camp, a caved-in log structure, formerly used as the powder house of the gold mine, was reached. Passing on the road, perhaps a quarter mile further, the bank of the stream was again reached. Before this time our views of the stream were a river about ten feet wide running swiftly over a very bouldery bed about seven or eight feet below the surrounding ground. Here, the stream ranged from 30 to 100 feet below, in a bed carved in a garnetiferous and staurolitic rock between a schist and a gneiss. The dip of the strata was about 60 degrees toward the west, direction of strike N. E. by S. W. The bed of the stream here abounded with pot-holes and carvings on the sides. One of these pot-holes is about four feet deep, as Starbird will testify as he experienced difficulty in recovering his mineral hammer from it.

Crossing over the stream, tumbledown buildings were seen, the site of Goldfield, Maine, a typical fraudulent enterprise. Here much money had been spent for machinery to transport, crush

and wash the rock taken from the top of the bank of the river. The machinery was operated by steam and the material washed by water pumped from the river. The elevation above water at this point was about 75 to 100 feet.

After descending again to the river bank and following up the stream, test-holes, three in number were found, two made in the schist or gneiss and one in a quartz vein. The two in the schist or gneiss showed only the typical rock, while the one in the quartz showed small amounts of pyrite and pyrrhotite.

As the sun was setting, the hunters returned, without game, to find everything prepared for the night.

Numerous incidents occurred that night. First, the stove, which Miller constructed from a grease can and stove pipe, set fire to the tent. The fire was extinguished with a pail of hot coffee and the stove thrown out. Starbird, who had brought pajamas slept with them over his clothes. Miller woke up in the middle of the night shouting, "Who stole my blankets?" Whelden slept on two pointed stumps, but did not discover them until midnight. However, all was well and we were up at daybreak.

Sunday, Nov. 10th, being fair and warm, all hands went gold panning. All that could be panned from the stream was water-worn garnets. Specimens of pyrite, pyrrhotite and poor specimens of andalusite were also obtained. The staurolite crystals were all waterworn, those within the schist being friable.

Returning to camp, Whelden and Miller made meal preparations, while Leonard and Starbird visited the site of the gold mine and brought back one of the bags of ground material. This bag was marked "O. G. M. Co. A, Goldfield, Maine."

After dinner, Whelden and Miller biked to the Houghton R. R. station for information while Leonard and Starbird arranged camp. It was learned that we were on the wrong branch of the river and that gold had never been found in the sands of the Houghton Branch, but had been panned on the East Branch of

the river. As it was too late to break camp and go to the East Branch, it was decided to hunt for deer on the next day (Armistice Day.)

At 5 A. M., November 11, the hunters were again on the trail of game, Leonard and Whelden hunted near camp, while Starbird and Miller walked five miles up an old logging railroad. Returning from their hike, via the stream bed of Houghton Branch, Miller fell in the stream three times. Partridges, bluejays and nuthatches were noted. A beaver dam in process of construction

was observed. Deer and moose tracks were seen but no animals.

Back at camp, we found that Whelden and Leonard had returned with a porcupine. After boiling, baking and frying, we were able to eat parts of the animal. Preparations were then made for departure.

In a drizzling November rain, we loaded our car, and after prying the auto out of several mud holes and cutting down a few trees, we managed to reach the village. "The Mushers of '29" returned, minus gold, minus game, but with cold memories of time well spent.

A MONTHLY FIELD TRIP OF THE MAINE MINERALOGICAL AND GEOLOGICAL SOCIETY

By EDWARD H. LEONARD,

Second Vice-President, Maine Mineralogical and Geological Society.

The party (fourteen in number) left the Society's rooms at 500 Forest Avenue at 8 A. M., July 28, 1929, with an old blast furnace and iron foundry situated in North Shapleigh, Maine, as the object of the day. We proceeded to Standish where we called on Mr. B. B. Witney, and obtained specimens of andalusite, purpurite, vesuvianite, pyrite, black tourmaline, and some small but very good quartz crystals.

On a hill back of Mr. Witney's home, there was found some orthoclase feldspar; in the bushes beside the road some trap dikes were noted; and in a ledge beside the road a few black tourmalines of very fair crystal structure were discovered. A part of this ledge was made up of Berwick Gneiss.

Leaving Standish, we passed through Limington and Limerick, arriving in North Shapleigh about noon. We climbed to a pine grove overlooking Little Ossipee Pond where we proceeded to satisfy the "inner man" with the good things we had brought with us, and after slaking our thirst from the "Old Oak-en Bucket" that hung in the old fashioned well, we were invited by Mr. Smart, the owner of the grove and the well, to see the fireplace he had built in his cottage. It was made of split field stone and Indian relics set in cement and looked very beautiful.

After a very enjoyable visit we proceeded up the banks of the Little Ossipee River to the site of the old blast furnace

and foundry. It was all overgrown with bushes. This furnace was first put in blast August 9th, 1837, by the Shapleigh Iron Co., and would make about one and a half tons of iron per day. At first they used shells brought from the sea shore for a flux, later a deposit of lime was found near at hand. The ore was obtained from the bottom of Little Ossipee Pond, near the inlet. According to an old report, three men could dig from seven to eight tons per day, the ore yielding 40 to 50 per cent good iron.

After visiting the furnace and foundry, we proceeded by boat up the Little Ossipee Pond to the ore deposit where we removed our shoes and socks, rolled up our pants and tried to imitate the ducks and water birds by digging in the bottom of the pond. I don't know what the birds get but we got some very good specimens of limonite (bog ore).

Leaving the Little Ossipee about 3 P. M. we returned, via Cornish. In passing along the road we came to a spot where we thought the road builders had not made it wide enough, so the cars were stopped and we began to enlarge it and in doing this uncovered some beautiful specimens of grossularite garnets, epidote, vesuvianite and some fair calcite crystals.

We then proceeded to the Twin Trails Tea Room where we had supper; after which we started for home, arriving in Portland about 11 P. M. having covered about 130 miles.

SOME PERSONAL OBSERVATIONS ON COLORED TOURMALINES AS FOUND IN THE STATE OF MAINE

By DR. W. B. MOULTON,
Honorary Member, Maine Mineralogical and Geological Society.

Tourmalines are always found in the pegmatite granite. Some have been located from surface indications. In feldspar quarries, as one gets to the edge of the good spar and the rock becomes more mixed, pockets are common which sometimes contain tourmaline crystals. Some stones that will cut gems have been found in the solid rock, but this is rare, since usually they have been found in cavities or pockets. These cavities are ordinarily faced on the inside to a large extent with quartz, and while there may be tourmaline crystals on the sides of the pockets, they are usually found in the bottom, imbedded in a coarse sand-like debris. Other crystals are not infrequently found with them. Fine crystals of topaz, caesium beryl, herderite, and others have been found in this way.

It has been my experience that nearly all of the pockets carrying tourmalines have seams running from them that no doubt reach the surface. I am not aware that they have been found at any considerable depth, in fact it is commonly observed that the gems decrease in quantity with depth.

When one cavity has been found containing gems, several others are likely to be found close by, but when these are exhausted no more may be expected within the distance of several feet.

Tourmalines do not seem to occur in any particular vein but about the pocket there will be found quartz, pure feldspar—usually called pocket spar—lepidolite, and colored tourmaline. I have found that color often follows for a short distance any seam that enters a pocket containing colored stones.

The original find made by Hamlin was a weathered pocket and the crystals were taken without blasting. This pocket contained the largest and finest tourmalines that have ever been seen and they have been distributed pretty well over the scientific world giving an international reputation to the little hill in Paris, Maine, that is called Mount Mica. Since

this original find tourmalines have been found in about a dozen places in the western part of the State.

As to color: Stones have been found covering the whole range of the spectrum, green being the predominating color. Stones of this hue have been found having great brilliancy and beauty, some closely approaching the emerald in color. When a tourmaline has this color it is entitled to the name of emerald, although strictly speaking it should be called the Brazilian Emerald, for the true Oriental Emerald is the green sapphire. When this gem approaches the color of the pigeon blood ruby it is called Rubellite.

Cookeite shells that plainly contained



Courtesy of Thurston M. Phetteplace.

Tourmaline Pockets in Mica Schist, (now filled with water), Mt. Apatite, Maine.

tourmalines are often found, showing the perfect imprint of the crystals, but now empty. Also tourmalines have been found that showed etching and some that have been broken and then formed new planes on the broken faces.

Considering the etching of the crystals, the broken and altered faces, empty

cookeite caskets that once contained gems, and the fact that these pockets are rather superficial and probably always communicate with the open air, one seems justified in saying that these gems are born, do grow, mature, decay, and die, and do have power to alter broken parts like living things.

FELDSPAR DISTRIBUTION IN MAINE

By STANLEY I. PERHAM,
Member, Mineralogical and Geological Society.

Feldspar occurs in Maine usually as pockets containing from a few hundred to several thousand tons of the rock. Now and then a true dike or wall of it occurs as a workable proposition. The largest of these rare occurrences is at West Paris, Oxford County, Maine. Here the rock carries less than 5% quartz. Most deposits or veins carry from 10% to 30% quartz.

In general the pegmatite body in southern Maine, from which feldspar is quarried, starts at the coast at Boothbay Harbor and travels in an east-west direction through Bowdoinham, Brunswick, Auburn, Paris, Albany, Stowham, to North Chatham, New Hampshire. It is roughly about thirty miles wide and one hundred miles long. Until five years ago, most operators thought that the mass of workable stone lay around Brunswick, Bowdoinham and Auburn. During the last five years, however, through development work and actual business quarrying, Harold C. Perham and A. C. Perham, have located reserves of first quality material which have proved that Oxford County is to be a center of distribution of feldspar on at least an equal footing with any other Maine locality. The largest group of quarries under one control is now located in Oxford County. The total of reserves in Oxford county alone of No. 1 feldspar appear to be about 1,500,000 tons or enough to supply the entire requirements for Maine spar for fifty years.

The feldspar industry has three principal centers—one around Brunswick, Bowdoinham and Cathance, with two mills pulverizing about 16,000 tons per

year; one near Auburn on the famous Mt. Apatite, worked by several independent operators supplying a mill at Littlefields, 2½ miles distant; one in Oxford county comprising a group of quarries located in Paris (the home of Mt. Mica), Albany, (where the huge crystals of beryl were found—see September, 1929 issue of ROCKS and MINERALS), Buckfield (with its great mineral sheet), Hebron (the home of Mt. Rubellite), and the latest finds in royal purple apatite, etc. About eighteen quarries comprise this section.

The first pulverizing plant for feldspar in the United States was built in Maine at Cathance in 1864 and is still pulverizing today. It has always produced the finest domestic stone of the pottery trade and is operated by the Trenton Flint and Spar Co. Four other mills are operating in the State at Bath, at Brunswick, at Auburn or Littlefields, and at West Paris.

Because of its superior fusing qualities and its remarkable uniformity in grade, Maine feldspar is much in demand, especially with those potteries turning out high quality wares.

Stone with hieroglyphic quartz in it is termed graphic granite; this is the stone in general use.

Stone practically free and clear of quartz is much sought after and is rather uncommon in workable quantities. West Paris is the only notable showing of this last stone, and it is to be found prominent at the A. C. Perham Feldspar Quarry. The dike here appears to be 65 feet high, 40 feet wide and 1200 feet long.

HO! FOR DIAMOND ISLAND, PORTLAND, MAINE

Named for its beautiful quartz crystals and well called "The Gem of Casco Bay."

By H. WALLACE NOYES,
Honorary Member, Maine Mineralogical and Geological Society.

The day is hot for it is July tenth. With hammer, bag and chisel, Tom, Dick and Harry, arrayed in their oldest and looking like tramps, pass in their quarters, which give them a bit of cardboard for Diamond Island and return. With a couple of toots the steamer glides out of her berth, passes the wharves where ships are unloading their cargo of freight, into the channel,—passing many groups of young people in yachts or rowboats, four masted schooner loaded to the gunwales awaiting their turn to discharge, by the breakwater with the lighthouse at the end, the harbor forts and then the refreshing ocean breezes reach us and make the day charming. One half hour's ride brings us to the "Gem." We pass several coves with their sand beaches and their bathers, costumed or scantily clad, making gay with the green swells that come in from the sea. We now pass under the shadows of the bluffs, rising abruptly from the water, ten, twenty and thirty feet high,—a gray schistose slate rock. Perhaps they have taken off their sober appearance and decorated in honor of our coming, for irregular bands of orange, red and yellow, lighted up by the sun give a rainbow appearance, very charming. This is due to the oxidating of the iron and sulphur in the rock compositions, which with the blue of the sky and the green of the ocean make "A thing of beauty and a joy forever."

Now we come to a big cove with a background of great oak trees. On one side at a long pier the steamer comes to a stand and we jump off. On the right is a high bank of sand and clay and on the top is what apparently was a cellar to a house of one of the old-timers, but the house was undoubtedly burned down. It was built on an Indian shell heap. It gives us a good chance to excavate and we find remains of broken pottery, bones, and arrow points.

About a quarter of a mile up the island is its highest point, the hill surmounted by a water tank to supply the cottagers who occupy about one half of the two hundred sixteen acres of the island. On the green slope on the south side of the island a stone wall goes across the island. This is made of large rocks which contain many beautiful crystals of quartz. (These have long since been carried away by the cottagers to decorate their lawns, piazzas, fireplaces, etc.). We operate on the side of the big hill and find schistose slate rocks, all filled with veins of quartz mostly in very small crystals but very clear. We load up with a number of samples of these and then go to the foot of the hill and take the Ravine Path through the northern section of the island, which leads to Fort McKinley. We come to a spring so charged with iron that it makes our heads swim as we drink of it. (A chestnut burr that we picked out of the bottom was changed to brown limonite). This path leads us through a thickly wooded section and on our way we uncover many lumps of brown limonite which shows twigs, leaves and branches changed to bog iron ore or yellow ochre. We also find graphite in some of the slate rocks. We fill our bags to overflowing and plod back to the steamer, feeling that our outing has been worth while,—combining pleasure with profit.

Minerals found in Portland, Maine, are as follows:—prehnite, calcite, epidote, hornblend, phyllite or spangled mica slate, garnets, amethyst, actinolite, radiated black tourmaline, quartz crystals, limonite, graphite, dendrite, talc, white quartz on talcose rock or schist.

THE COMPETITIVE STUDY CONTEST HELD BY THE MAINE MINERALOGICAL AND GEOLOGICAL SOCIETY

By KENNETH E. CHICK,
Member, Maine Mineralogical and Geological Society.

The Maine Mineralogical and Geological Society, being a wide awake organization, always plans to have something to interest its members in the way of recreation and knowledge of minerals and geology.

H. Wallace Noyes, at the regular meeting of the Society in November, last, gave up his plan for a mineral competition. The plan was accepted with great interest. Mr. Noyes very kindly offered to allow us to use his fine laboratory for the meetings which were to be held in January, 1930.

The objects of the competition were: to create an interest in the meetings by bringing the members together, to create an interest in minerals, to learn more about minerals, and to compete for prizes.

Mr. Noyes was more than generous by donating four fine specimens as prizes: a cluster of garnets, first prize; a chalcedony geode, second prize; a quartz geode, third prize; and a group of pyroxene crystals, fourth prize. Prizes were won as follows:

1st prize: Herbert M. W. Haven.
2nd prize: Leonard H. Starbird.

3rd prize: Kenneth E. Chick.
4th prize: Bernard L. Moxcey.

The minerals studied were: quartz, feldspar, calcite and garnet. All the members were requested to bring specimens to compete for points. There were many rare as well as beautiful and valuable minerals brought in for our inspection and study.

There were about twenty members actually competing, but there were many visitors present also.

Some of the subjects studied were: chemical composition, specific gravity, taste, species, streak, color, lustre, tenacity, and uses.

A great deal of knowledge was derived from the information imparted, and from the fine collections on display. Mr. Noyes presented the prizes at the regular meeting of the Society and because of his own high standing in the competition he was himself presented with a copy of Butler's *A Handbook of Minerals*.

The members of the Maine Mineralogical and Geological Society found this contest to be a great source of information, learning and pleasure.

GOLD IN MAINE

By C. M. JURGENSON,
Member, Maine Mineralogical and Geological Society.

Gold in small quantities has been found in widely separated parts of the State, but up to the present time no deposits sufficiently rich to justify mining on a large scale have been found.

The gold found in Maine is mostly placer gold and may be panned from the gravel and sand of certain streams and rivers, notably Swift River in the town of Byron, and Kebby and Gold Streams in Township 1, Range 6.

The gold is fairly coarse and rough, which would indicate that the source of it is a gold bearing ledge or vein at a great distance from where it is found, as it does not indicate having traveled very far.

During the spring and summer of 1928, a tunnel was run on what is known as Nigger Hill near Winthrop in Kennebec County. The tunnel was driven for the purpose of developing what was thought to be a gold bearing quartz vein. The formation is schist impregnated with small veins of quartz running in all directions, but no well defined vein of quartz seems to be in evidence. The tunnel, however, followed a cleavage in the schist that might readily be mistaken for the hanging wall of a vein.

The owners claim very high assays of gold across the entire face of the tunnel, but there is no further development work being done on this prospect at present.

OUR FRYEBURG, MAINE, FIELD TRIP

By RAOUL F. LEVESQUE,
Member, Maine Mineralogical and Geological Society.

Leaving Portland on the morning of September 8, last, eleven members and friends of the Society started out with hopes of enriching their collections with specimens obtainable in quarries in the vicinity of Fryeburg, Maine. The only stop before reaching our destination was made at a cider mill owned by a friend of the members and all hands were treated to sweet cider.

Arriving at Fryeburg about noon, we picked up a member of the Society who was visiting there at the time, then went to the residence of F. H. Peterson, who was to guide us on our trip. Our first destination was the Eagle Gray Granite Quarry which is located at the base of Stark's Mountain.

Excellent specimens of garnets were found, also crystals of mica and some crystals of pink orthoclase feldspar. From there we proceeded to Redstone Quarry, Redstone, N. H. This quarry is located at the end of the Wildeat Range.

The members of the party viewed the Redstone Granite Works, where beautiful specimens of polished red, green and gray granite were obtained, the red and green granite being of a very coarse texture.

We climbed Redstone Ledge to the upper part of the quarry where we found crystals of smoky quartz and feldspar. One of our members procured a very

clear crystal which at present has not been identified. It is colorless and of small proportions, having eight crystal faces. The members of the party were caught in a shower while in the quarry and few escaped getting drenched. Bringing our mineral hunt to an end, we returned to the home of our guide where we were able to dry out and to enjoy hot coffee and doughnuts served by him.

Mr. Peterson then brought out several boxes containing smoky quartz, amethyst and fluorite crystals, permitting the members to take any number of these specimens they desired. We also viewed a wonderful collection of buttons which Mr. Peterson has obtained from all parts of the world, he having been a sailor for twenty-five years. The collection contained approximately 65,000 buttons, many having been once owned by kings and other notables.

We left our cordial host and guide during the evening and proceeded to Hiram, Maine, where we called on our Member, H. W. Merrill. He showed us his herbarium which included the smallest fern in the world; he also showed us some very fine books on English Orchids which were in color. We then went to Gorham, Maine, where we all ate supper at a store in the village; arriving home about twelve midnight, after covering one hundred and twenty-eight miles.

A TRIP TO A DIATOMITE LOCALITY

By BERNARD L. MOXCEY,
Member, Maine Mineralogical and Geological Society.

On the morning of August 25, 1929, the Society started on its August Field Trip, part of this trip being confined to a study of the diatomite deposit at Cornish, Maine.

We proceeded to the residence of J. H. Stone at Steep Falls, Cornish. Mr. Stone presented to each member of the Society a bottle of "Alumet Metal Polish" and a box of "Automobile Cleaner and Polish" that were made from the diatomite taken from his deposit.

From Mr. Stone's residence we rode a short distance to an old Free Baptist Church. This was the first building erected at Cornish and Mr. Stone was using it as a store house for the diatomite. The diatomite is dug from the bog and placed in the sun to dry. After being dried it is carried into the storage house where it is pulverized through a fine mesh screen to remove the fibre, and is then bottled or boxed for shipment.

We left the church-store house for the bog which we reached after a short walk and which covers approximately 150 acres. When we walked out on this bog

it quivered and quaked and reminded us of a mass of jelly. Some of the members dug up some of the diatomite to take home for their collections.

BEAUTY IN MINERALS

By ALBERT C. BATES,
Newark, N. J.

"A thing of beauty is a joy forever," so sang Keats in his poetic statement of a fact. That which constitutes beauty is individual and may reside in color, form or setting, or, better, a combination of these attributes. Beauty is an expression. Its appeal, as manifested in a particular object, is not universal as we shall presently show. We do not all alike see the meaning or import of beauty, nor do we care to analyze as to why our perceptions of beauty differ as they so often do. Sensitiveness to color may be strong and form of less consequence to a person. Ensemble often does appeal to all alike. So with that bit of prefacing, let us get to our subject.

In the March issue of this magazine Ward's Natural Science Establishment, Inc., offered a choice of three different crystals in return for a reader's opinion of "What is the most beautiful mineral in all the world?"

Most of the responses to this invitation seem to indicate that preference was inspired by observing the minerals used in jewelry and of those collected locally, and with but little knowledge of the great beauty offered in the wider range, such as may be seen in the great collections. The reason for not naming some of the minerals having beautiful colors, as for instance that of Crocoite, may be because few collectors have seen the glorious specimens of that mineral from Tasmania. And this holds true of a long list of minerals neglected in these responses, as Wulfenite, Rutile from Georgia, Japanese Stibnite, blue Topaz, Diopside and Smithsonite. It is true that a choice specimen of any of the minerals named is costly. But a specimen that will show the color of any one of them may be had at moderate cost.

Caleite is named but once, which would indicate either that it was too common a

mineral to prefer or that but few have seen the wonderful Lake Superior Calcites enclosing Copper, or the magnificent Joplin Calcites, some of which combine in one single large crystal the colors yellow, pink and violet.

Gold in stringers in quartz is mentioned once, but no one names crystallized or leaf-like Gold. It was anticipated that Diamond would prove a favorite, but it was named twice only, while the Opal is the favorite of fourteen. Fifteen replies from Maine and only one favors Tourmaline; and of five from California not one chooses that mineral. The Agate has five admirers which seems strange since it may be seen in beautiful polished objects in many places other than in collections.

Rhodochrosite is also forgotten, or it is as little known as the delicate Apophyllites of Poonah and Mexico.

Possibly some of all of these minerals would have been named if the older generation of collectors had taken sufficient interest to respond. The purpose of this offering was meant to be educational in that it would call attention to the beauty of many minerals not commonly known, and so create a desire to learn more about them.

CLASSIFIED SUMMARY OF REPLIES

Native Elements: Diamond 2, Sulphur 1, Gold 1, Silver 1. *Sulphides:* Cinnabar, 1, Bornite, 1, Pyrite 2. *Haloids:* Fluorite 2. *Oxides:* Agate 5, Amethyst 4, Rock Crystal 5, Tiger Eye 1, Opal 14, Ruby 2, Sapphire 1, Hematite 1. *Carbonates:* Caleite 1, Malachite 2, Azurite 1, Aurichalcite 1. *Silicates:* Amazonstone 2, Labradorite 2, Hiddenite 1, Jade 1, Beryl 2, Aquamarine 1, Emerald 2, Garnet 1, Tourmaline 4, Lepidolite 1. *Vanadates:* Vanadinite 1.

FIELD MUSEUM NOTES AND NEWS ITEMS

Contributed by

THE FIELD MUSEUM OF NATURAL HISTORY

Chicago, Ill.

Three stages in the development of the iron industry are represented by models on exhibition among the economic collections of the department of geology at the Museum. One of the models shows a Catalan forge of the type used for smelting iron ores in Europe and America during the 18th and early 19th centuries; another shows its successor, an iron blast furnace of a type now obsolete, which was used during the first half of the 19th century; and the third model is of a modern blast furnace.

The steps in the separation of silver from lead, including specimens of ores, by-products, details of the processes, and a model of apparatus employed, are illustrated by an exhibit in the department of geology at the Museum.

It is seldom that anything but the bones of prehistoric animals which have been extinct thousands of years, is found. However, on exhibition at the Museum is a small specimen of the skin and hair of a mammoth as well as a skeleton of one of these great beasts. The hair and skin, presented to the Museum by Allison V. Armour, came from the body of a mammoth which was discovered buried in the ice on the peninsula of Tamut, Siberia, in 1799. The glacier had apparently acted for thousands of years as a form of natural cold storage. The body was released by a thaw in 1803. Dogs of the native people, and wild animals, fed upon the ancient flesh, but the balance of it, with considerable hair and skin still left, was re-preserved to St. Petersburg in 1806.

A gift of ninety specimens of gems, minerals, and North American Indian artifacts, was presented the Museum by Frank Vondrasek of Cicero, Ill.

A beautiful white jade tray from China, carved in the shape of a lotus leaf, with a dragon fly represented as crawling over it, has been presented to the Museum by an anonymous donor of Chicago. The piece is unusually translucent.

A good idea of how diamonds are found in the mines of South Africa and elsewhere may be obtained from an exhibit of diamond bearing gravels and earths in the department of geology at the Museum. Included are several specimens showing diamonds in the rock matrix as originally found. Associated rocks, minerals, and gem material such as garnet, chrysoberyl and zircon are also shown. Fields of Brazil and Arkansas as well as Africa are represented.

Interesting for comparison with modern evergreens is a collection of fossil cones and branches of extinct South American evergreen trees in the department of geology.

How large amounts of gold and silver are retrieved from floorboards, employees' shoes, exhaust fan concentrates of dust and other matter, and elsewhere in large jewelry manufacturing shops, is illustrated in one of the economic exhibits at the department of geology.

MUSEUMS OF THE WORLD

This is the continuation of an interesting series of articles on famous Museums of the world, noted for their mineral collections.—*The Editor.*

THE BRITISH MUSEUM OF NATURAL HISTORY

The building at South Kensington, which contains the Natural History Departments of the British Museum will celebrate its jubilee next year as it first opened its doors to the public on the 18th of April, 1881; but the collections housed in it have a much older history, for among them are specimens, including an important herbarium, which were in the Sloane Collection. The British Museum, indeed, owes its foundation to the decision to accept the offer made by Sir Hans Sloane in his Will to dispose of his extensive collection to the nation for the sum of £20,000 (about \$100,000) which was far below its intrinsic value. Incidentally it is of interest to note that the money was raised by means of a lottery, one of the last sanctioned by Parliament, and much of the Act of Parliament authorizing the acquisition of the Sloane Collection and the Harleian Collection of Manuscripts, and the provision of "One General Repository for the better Reception and more convenient Use of the said Collections and of the Cottonian Library and of the Additions thereto" is taken up with the details of the lottery.

The growing congestion at the old building at Bloomsbury and the difficulty at that time of extending the site led the Trustees in 1860 to decide to remove the Natural History Departments. In 1863 part of the site at South Kensington, which had been used for the International Exhibition the previous year, was purchased by Parliament for a new Natural History Museum. Many years passed before the plans prepared by Mr. Alfred Waterhouse were accepted by the Trustees, and the erection was not begun until 1873; the building was handed over to the Trustees in June 1880. In 1883 a building was erected at the back for housing the specimens preserved in spirit

owing to the risk of fire in the main building. The former was subsequently doubled in size, but nevertheless the congestion in it became so great that a further large four-storeyed building was erected in 1922 and this again is being extended this year (1930) to provide additional accommodation for the collection of insects. The extreme length of the front of the main building facing the Cromwell Road is 675 feet, and the height of the central towers above the level of the ground is 192 feet. The architect's original conception of the completed building was a square block each side similar to the present front, but that idea has long been abandoned owing to the necessity to make the fullest possible use of the site. In the northeast corner of it the new building for the Museum of Practical Geology is now rising. It will abut on the Natural History Museum, but will not be connected with it. Behind the main building there will shortly be erected one half, or rather more, of a vast new Whale Room. Throughout the Museum the so-called ground floor rests on a lofty basement, actually on the level of the ground, which has been invaluable for studies, workshops, and store-rooms, and has enabled the Museum to gain its eminent position as an important centre of research.

The Sloane Collection contained minerals, but as mineralogy as a science began much later in the century most of them were metallic ores or ornamental stones. In 1799 the Trustees obtained the large collection, of some 7000 specimens, which had been brought together by Charles Hatchett, F. R. S., an eminent chemist; it was rich in minerals and comprised also good specimens from Russian localities collected by Count Apollos de Mousin Poushkin. In the same year the fine

mineral collection belonging to the Rev. C. M. Cracherode, a Trustee, was bequeathed to the Museum. In 1810 by means of money specially voted for the purpose by Parliament the collection of the Rt. Hon. Charles Greville was purchased. It included collections made by Baron von Born, of Prague, and Marchese Ippolito Durazzo, of Genoa, and numbered about 14,800 specimens, among them being fine examples of phosgenite, aragonite, euclase, corundum, and tourmaline. In 1816 the large collection belonging to Baron F. C. von Beroldingen was bought, and in 1823 the collection, numbering some 2000 specimens, of Vesuvian minerals was purchased from Dr. Monticelli, of Naples. For nearly forty years no large collection was acquired, though many choice specimens were added, some of the best being purchased at the sales held by Henry Heuland. In 1860 was bought the large collection which was begun by Thomas Allan, the Edinburgh banker, and added to by R. P. Greg, the son of R. H. Greg, who bought the collection on Allan's death. It numbered 9500 specimens, and included those collected by Charles Geisecke in Greenland, many fine Norwegian specimens, and a magnificent series of British minerals. In 1861 many specimens were acquired from the collections of J. R. Campbell and William Nevill, and in 1865 the Trustees purchased the extensive collection formed by General N. I. Kokcharov, Director of the Mining School at St. Petersburg (Leningrad), which contained about 3000 specimens and was rich in Russian and Siberian minerals, especially phenacite and topaz. In 1873 Benjamin Bright presented the collection formed by his father and grandfather. In 1893 J. C. Williams presented 500, mainly Cornish, minerals; in 1897 200 specimens of Harz minerals were purchased from the collection of Bergrat F. C. L. Koch; and in 1907 Miss Caroline Birley's fine collection, which was so rich in zeolites, was received by bequest. The Trustees received another valuable bequest in 1910, the best of the collection belonging to F. Tendron, for

many years chairman of the St. John del Ray Mining Company. In 1912 the Walker Collection came into the market and many specimens were acquired for the Museum. In 1914 and subsequently Mr. F. N. Ashcroft gave a very large number of specimens of zeolites which he had collected from many localities. In 1914 the Earl of Denbigh made the gift of a series of specimens which had probably formed the Pennant Collection. In the following year Lady Church conveyed, in accordance with the wishes of her husband, the late Sir Arthur H. Church, to the Trustees his beautiful collection of choice and selected faceted stones, mostly set in gold rings; it includes a fine example of the rare manganese garnet, spessartite, and is particularly rich in zircons. In 1917 Dr. C. T. Trechmann presented an interesting and valuable series of 100 minerals from the collection of his father, the late C. O. Trechmann, and in 1926 he generously gave the remainder of the collection of 4200 specimens. In 1922 a fine collection of Swiss minerals was received by the bequest of the late Rev. J. M. Gordon, and in the following year an important and unique selection of 145 mineral specimens was obtained from the late Mr. S. G. Perceval's collection. In 1927 the Museum received the collection of about 3000 specimens of minerals formed by the late Prof. A. Liversidge.

Attention has been paid to the Department of Mineralogy alone because it is the one in which the readers of this journal would be mainly interested. It may be mentioned that the Department contains a large collection of meteorites and an extensive collection of igneous rocks. The collections in other Departments are just as comprehensive; there are, for instance, about 6 million insects, 5 million plants, 730,000 birds, 90,000 mammals, 120,000 fishes, 680,000 mollusca, 140,000 crustaceans.

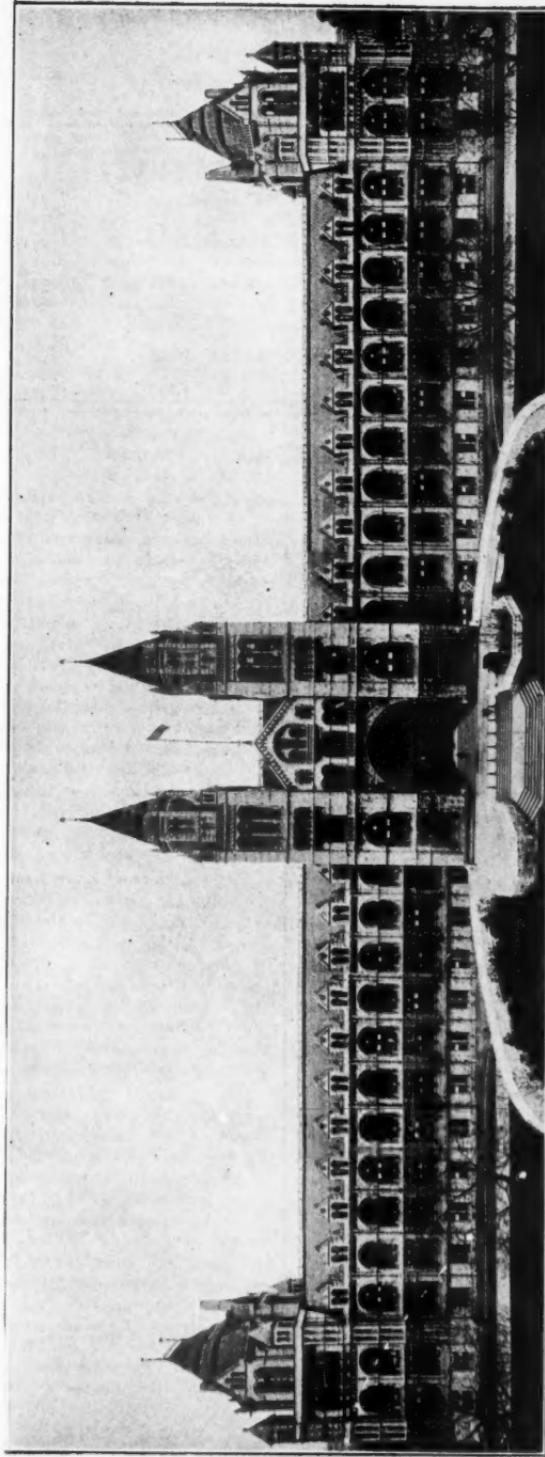
The Department of Mineralogy is well equipped for the physical and chemical investigation of minerals, including an X-ray installation.

Interested members desiring to learn how our drive for a monthly is progressing may write in at any time, enclosing a self-addressed stamped envelope or card, and we will be glad to give them the latest figures.

Dr. H. C. Dake and wife, of Portland, Oregon, recently called on W. H. Matchett at Hoquiam, Washington, and had the pleasure of viewing his fine collection of polished minerals.

Courtesy of British Museum (Natural History)

BRITISH MUSEUM (Natural History)
SOUTH ASPECT



THE GEM DEPARTMENT

Conducted by
GILBERT HART

Each issue Mr. Hart will give in this department information concerning gems and gem minerals. As Mr. Hart invites correspondence relating to the department, letters should be addressed to him as follows:

Gilbert Hart, St. Edwards University, Austin, Texas.

JASPER

Jasper is defined in modern mineralogical books as a more or less impure silica, usually opaque and colored by oxides of iron. Its origin is often uncertain and its occurrence varies from mere pea sized concretions to definite beds of vast extent. Mineralogically it is distinguished from other types of silica by its microscopic characters. It is essentially a very finely fibrous quartz, the fibers being resolved only by high magnification. Chalcedony can not be similarly shown of a fibrous character, and more coarsely crystalline quartz is visible as definite crystals. Chemically it is like quartz, simple silicon dioxide, with various pigmenting minerals.

Jasper has been a gem stone since time immemorial. The ancient Hebrews had a "yashpah" in their earliest elaborate jewelry. To the Greeks and Romans, jasper was more like our chalcedony and included every bright colored chalcedonic gem. With the advance of civilization, separate names were given to the carnelians, chaledonies, and agates, leaving jasper as the general name for opaque stones of the family, corresponding usually with the geological definition noted.

But even the opaque stone has its beauty and is diligently searched for by collectors for new evidences of pleasing colors. Jasper, as a gem, is worth little more than the cost of cutting but its specimens represent so many variations of form and coloration that even a small collection represents an array of hues as diverse as an Eastern bazaar. The most common colors of jasper are red and brown, both being caused by oxide of iron in different stages of hydration. The hardness enables jasper to yield a brilliant polish; this coupled with the red

color gave rise to the name "Fire-stone" of the ancient Greeks who carefully polished slabs in the form of concave mirrors for use in starting their fires by reflecting the sun's rays. Jasper of uniform color is rarely used in ornamentation, but the black jasper was long used under the name of "Lydian Stone" as a testing stone to try the color of gold as an aid in judging its purity.

Green jasper has been called prase. This stone is usually variegated in shades of green and greenish white. Anciently it, and similar greenish jade, were thought to be of medicinal values in curing and warding off the diseases of the kidneys, and were called such names as colic stones and kidney stones.

Banded jaspers have been known from the days of Egyptian Dynasties and are often included under the name Egyptian Jasper. Some modern varieties are creolite and zonite, while the Egyptian material is often sold as Nile Stone. These differ from agate in their opacity and in the variation in widths of the bands. In general their colors are more brilliant than the translucent agates.

The greatest gem use of jaspers is with the mottled varieties. Colors are found in no geometric relations, spots, zig zag linings, cloud flakes, veins and every conceivable combination. Bloodstone is usually of this type, a black or green base, with splashes or clots of red, closely resembling spilled blood. Several varieties have been given names from localities or peculiar coloration, but all retain this unique coloring. Ruin-jasper, flower-jasper, and moss-jasper are similar stones worked out from jaspers of variegated character with shadings suggestive of the names.

Flint and chert are closely allied to the jaspers in origin, and differ mostly in that they are the common variety, devoid of the beauty found in jasper. Occasionally flint nodules are worn as charms, because of unusual shapes developed in their formation. Sycite (fig stone), Devil's Bread and Frog-stone indicate flints formed in imitative outlines; Night-mare stone and Witch-riding-stone are names for fantastic shapes of similar concretions.

Mixtures of opaque jaspers with lucid quartz or bright chaledony give us a further type of gemstone. Kinradite is such an intergrowth of quartz, jasper and chaledony. Another un-named grouping found by W. B. Pitts of Sunnyvale, California, shows a general background of brown and red jasper intermixed with white spherules of quartz, veinings of bluish quartz and occasional bands of agate-like chaledony. Jasper may be definitely banded with transparent chaledony yielding a jasper-agate of jasponyx.

There are about 70 names in the mineralogical literature of simple jaspers, mostly for the unusual gem varieties; and over 100 for quartzose rocks which are largely jasper. Many of these names have been applied to small pieces of special coloring and have no general application.

Boodle Lane of Galena, Kansas, sent us three cards showing interesting views of his mining city. He also sent us his card with four minerals mounted thereon—a unique card for a dealer.

Since the beginning of the year, the Gem Shop of Wolf Creek, Mont., sent us 26 new subscriptions and the Ward's Natural Science Est., Inc., of Rochester, N. Y., 18 or a total of 44 for the two concerns. We are grateful for the interest and co-operation manifested by these two warm friends of ROCKS AND MINERALS and especially for their assurances that they will be with us should the magazine come out monthly.

Jasper's origin is usually in a watery solution of silica. Percolating ground water absorbs silica from the rocks and finally through evaporation or other change drops the dissolved material in the form of jasper. The other impurities of the solution are deposited at the same time, yielding the colors; and as the character of the solution changes so do the colors of the deposit, now a red, later a brown and earlier perhaps a yellow. The most common jaspers are formed close to the surface, but at times the material is deposited at considerable depths. These deep-seated deposits are the most productive of vividly contrasting colors and of the mixtures with other types of silica, quartz and chaledony.

Jasper is found almost everywhere. In regions of sedimentary rocks flint is common, and even flint from a cotton field may contain beautiful colors under its dull gray coating. Where there are recent lavas, as through much of the western states, jaspers are found close to the volcanies. The heat of igneous activity increases the capacity of the waters to carry silica in solution so that a large region is affected by their deposits. In areas of granitic rocks jaspers are more rare; but the industrious collector can usually find many interesting specimens within a day's travel of his fire-side.

Hatfield Goudey, 225 Montgomery St., San Francisco, Calif., one of our warm friends on the Pacific Coast, is keenly interested in organizing a local mineral club and a Pacific Coast Mineralogical Society. His plans are to band all collectors in the San Francisco Bay Region into a local club and if those of our members residing in Oregon and Washington and in Southern California were to form local mineral clubs also, to unite all these clubs into one main Society—the Pacific Coast Mineralogical Society. All members residing on the Pacific Coast are cordially invited to write Mr. Goudey for further information and we hope to announce in an early issue the formation of some of the clubs.

LITTLE JOURNEYS

BY ALBERT C. BATES
Newark, N. J.

This is the continuation of an interesting series of articles on dealers and collectors that flourished forty years ago.—The Editor.

It seems to me that these little jottings would be very incomplete without making a "Little Journey" to some exchangers. Most all exchanges are made with persons at a distance from one's home and so becomes a matter of correspondence. It has often occurred to me that a code governing exchanges, one that would insure equitable treatment as to values, giving lists as to labelling and wrapping and packing, would be very desirable. It would help all collectors willing to enter into exchanging if some one with experience would draft such a code. Have it printed as a leaflet to fit into an envelope along with a letter and offer the leaflet in lots of 25 at a fair price to such collectors as desire them.

In my more than 40 years of collecting I have had some curious experiences, not alone with youngsters to whom pretty fragments constituted a fair offering, but with those living near a good locality, or with dealers having large stocks who should know how to give fair treatment. I should say that my exchanges with dealers has been uniformly fair except in one instance, and, passing over the fun had with youngsters I will give the story of this exception.

I live but a few miles from Paterson, N. J., to which place I made frequent trips, often with fellow club members, to collect the group of zeolites that occur abundantly in the trap-rock quarries of this locality. The variety of minerals here found is so great and plentiful at times that it would be foolish to load up with any but choice specimens. So that I had at my home large numbers of "duplicates", to use that misnomer. So I wrote to a famous German dealer living in a university town for leave to submit a shipment of these minerals. I prepaid the express charges on a heavy, carefully packed and labelled case of these minerals only to get a letter in due

course stating that the specimens were so poor that they had to be thrown away as waste material. The shipment was of very clean crystals suitable for show as cabinet specimens, certainly suitable for the purpose of chemists in their studies. So I decided upon sending no more Paterson material abroad.

But I did want a lot of foreign specimens and the way to get them opened for me thus wise. The New York Central Railroad was building a short cut through Herkimer County, N. Y., to the Adirondack Mountains. Near Middleville the cut was through a ledge of sandstone in which occurred the famous "Herkimer diamonds," probably the finest loose crystals of quartz found in quantities anywhere so far located in the world. It was my good fortune to have a salesman who "made" Middleville monthly and he it was who took upon himself, knowing my insatiable desire to get these crystals, to arrange with a gang foreman to pick up and save for him at least one cigar box full a month. Some months he brought me three boxes. The locality was very prolific of these crystals and old collectors will recall the Ads of A. B. Crim of Middleville offering 100 assorted fair sized crystals in a box for \$1.00. The Crim stock was made up of several million crystals and they had a ready sale at the Chicago and Buffalo World's Fair. These crystals, because of their beauty, quality and size, lent themselves admirably for exchange purposes and, further, they were much sought after. So to the European dealers my letters went explaining in detail my offering and my want list. To Russel of London, Krantz of Bonn, Julius Boehm of Vienna, and several others but best of all to Rathgeb and Baker of Schemnititz. All these trades were successful from any point of view,

especially with Schemnitz where Amethyst crystals in beautiful groups were found.

Collectors who wish to exchange with European dealers should have good material to offer; describe minutely the specimens they have, name prices for each item and correspond until a complete understanding is arrived at. This because of the costs involved in making an exchange and because of the great difference of view points regarding the

particular matter. I invariably asked of every one the privilege of sending my offering first. There is a way to avoid making a mess of an exchange—observing the Golden Rule and an understanding of human nature as may be noted in ordinary correspondence. But the best word is: Do not try to exchange unless you have good specimens to offer for equally good specimens of another variety and the whole matter carefully arranged in advance of sendings.

DONATIONS TO ROCKS AND MINERALS

One of our warm friends and admirers, Mr. Ernest M. Skea, of Pilgrims Rest, Transvaal, South Africa, recently sent us 84 pairs of unused 1½ penny King George tete-beche stamps, of the Union of South Africa, as a distinct donation to ROCKS AND MINERALS. Mr. Skea wishes us to sell these stamps, among our members if possible, and use the proceeds for financing the magazine, especially if it is to come out monthly (as per our announcement in the December 1929 issue). The following excerpts are taken from his letter:

"You will find enclosed a number of 1½ penny, tete-beche, King George heads, Union of South Africa stamps. I wish you to accept these to sell, the proceeds to go towards helping out ROCKS AND MINERALS. I was fortunate enough to clean out two of our Post Offices of all copies before the officials could dispose of them to the general public, hence the reason for sending you a fair number. Kindly understand that I desire no returns as the sending of these stamps is a distinct donation towards gaining funds for the production of our magazine."

We are very grateful for the interest in ROCKS AND MINERALS as manifested by Mr. Skea and we sincerely hope that our present efforts to make the magazine a monthly may be crowned with success and that Mr. Skea may be thus rewarded in seeing it come out more often.

We have received from Mr. Skea a number of very cordial and interesting

letters and we have been most gratified to learn that our efforts in publishing ROCKS AND MINERALS is meeting with his hearty approval.

The stamps sent by Mr. Skea are offered our members on another page.

Mr. Albert Bates, of Newark, N. J., another of our warm friends and admirers, and a regular contributor to the magazine, recently donated to ROCKS AND MINERALS a large number of catalogs, price lists, pamphlets, etc., that were issued some years ago by the many dealers that flourished in those "good old days".

Just a hasty glance through these catalogs and price lists is enough to convince one that in days gone by there was a far keener interest in minerals and in their collecting than what now seems to be the case. Collectors were everywhere and in large cities as New York, Philadelphia, and Washington there were up-to-date dealers who carried immense stocks, judging from their catalogs and price lists. Hopping, Niven, English, Ward's, Foote, Howell, Stillwell, and Fuller are only some of the dealers that catered to collectors—and what a wealth of material they had to offer, too. The catalogs that they issued may never be duplicated; large, fully illustrated with many interesting notes—they were more like text-books than catalogs.

We are grateful to Mr. Bates for this donation as it makes a valuable addition to our mineralogical library.

A COMPILATION OF GEM NAMES

BY GILBERT HART

St. Edwards University, Austin, Texas

Mr. Hart and ROCKS AND MINERALS will be glad to have readers send in additional gem stone names not here included or suggestions as to any corrections in names which they believe should be made.

This is a continuation of the very interesting compilation of gem names (the largest ever printed) made by Mr. Hart, the first installment of which appeared in the December, 1927, issue of the magazine. This list will be continued until completed.—The Editor.

- Orthose**—orthoclase, moonstone.
- Ouachita Stone**—quartz rock, novaeulite.
- Oucosine**—muscovite compact and crypto-crystalline.
- Ouvarovite**—uvarovite.
- Ox Eye**—labradorite.
- Ozarkite**—thomsonite, white, massive, from Magnet Cove, Ark.
- Pagoda Stone**—agalmatolite.
- Pagodite**—agalmatolite.
- Paphos Diamond**—quartz, rock crystal.
- Parisite**—hexagonal, usually in pyramids, hardness 4.5, specific gravity 4.36, fluo-carbonate of calcium.
- Passauite**—wernerite, white.
- Paste**—an artificial lead glass of high luster used to imitate gems.
- Patrick**—alabaster, gypsum, local term in Derbyshire.
- Paulite**—hypersthene.
- Peach**—tourmaline.
- Pealite**—opal, geyserite.
- Pearl**—a lustrous calcareous concretion with animal membrane between successive layers, deposited in shells by various mollusks.
- Pearl Corundum**—corundum, bronzy color, opalescent.
- Pearlite**—geyserite opal.
(2) obsidian, spherulitic.
- Pearl Opal**—opal, opaque bluish white to pale yellow or red.
- Pearlyite**—obsidian.
- Pebble**—quartz, rock crystal, especially as found in water-worn gravels.
- Pecos Diamond**—quartz, rock crystal from the Pecos River District, Texas.
- Pectolite**—member of the pyroxene group of silicates; monoclinic, usually acicular; white; hardness 5; specific gravity 2.75; silicate of calcium and sodium, with hydrogen.
- Pegmatite**—coarse grained igneous rock composed of quartz and feldspar, and rarely with other minerals.
- Pelhamite**—serpentine.
- Pelion**—cordierite.
- Pennsylvania Diamond**—pyrite.
- Pericline**—albite, pearly white.
- Peridot**—olivene.
- Peridot of Brazil**—tourmaline, green and transparent.
- Peridot of Ceylon**—tourmaline, honey-yellow.
- Peristerite**—albite, iridescent.
- Persian Lapis**—lapis lazuli.
- Perthite**—a feldspar, mixture of orthoclase and microcline in thin laminae, often aventurine, usually flesh-red.
- Peruvian Emerald**—beryl, best emerald from Muzo, Colombia.
- Petroskey Agate**—quartz, beckite, cemented and silicified fossil coral.
- Petrified Honeycomb**—quartz, beckite.
- Petrified Wood**—quartz, wood replaced by silica, usually quartz, but also chaledony and opal.
- Phantom Quartz**—quartz, rock crystal with inclusions arranged in definite zones suggesting an internal figure, due to deposition of the impurity on the crystal face during its growth.
- Phenacite**—hexagonal, usually in rhombohedra; white, red or yellow; hardness 7.5 to 8; specific gravity 2.96; silicate of beryllium.
- Phenomenal Gem**—any gem which shows play of color or change of color in artificial light, or which shows a movable line of light.
- Picrolite**—serpentine, resembles jade.
- Piedmontite**—epidote, brownish red.
- Pigeon Blood Ruby**—corundum, most prized shade of ruby.

Pin Fire Opal—opal with very small areas of individual colors.

Pink Sapphire—corundum, rose or pink.

Pink Topaz—topaz, pink, either naturally or made so by heating a yellow or brown stone.

Pink Wollastonite—diopside, lilac, from San Francisco, Calif.

Pipe Opal—opalized belemnites, a long narrow cigar-shaped fossil; also applied to any long narrow opal-filled cavity.

Pipe Stone—catlinite, compact red clay.

Pisolite—caleite, concretionary limestone similar to oolite but in larger grains.

Pistacite—epidote, greenish.

Pitchblende—a complex oxide of uranium, usually massive, color black, its value lies in the content of radium, and as such is sometimes used as a gem.

Pitch Opal—opal, brown, luster pitchy.

Pitchstone—obsidian, with pitchy luster.

Plagioclase or

Plagioclase Feldspar—a sub-group of feldspars in which there is an unlimited graduation from pure albite to pure anorthite, all members of this series are plagioclase; the following have been used as gems: **Andesine**, **Labradorite**, **Oligoclase**.

Plasma—quartz, massive, translucent, dark grass green with white or yellow inclusions of celadonite or delesite.

Platinum—the native metal is rarely mounted as found in nuggets.

Pleonaste—spinel, dark green to black.

Polyadelphite—andradite, massive, brownish yellow.

Polyerase—orthorhombic, usually in prisms; brown; hardness 5 to 6, specific gravity 5.04; niobate and tantalate of yttrium.

Porcelain Jasper—clay, naturally baked and hardened by heat.

Porcelain Spar—wernerite, white.

Porphyry—a rock with variegated structure showing usually larger crystals of one mineral.

Pot Stone—talc, impure and dark colored.

Prase—quartz, massive, translucent, usually spotted in various shades of green caused by inclusions of actinolite or chlorite.

Prase Opal—opal, translucent, apple-green.

Precious Chrysolite—olivene, pale yellow green, transparent.

Precious Coral—coral, red.

Precious Garnet—any garnet suitable for cutting, usually refers to pyrope or almandine.

Precious Opal—opal showing a play of colors.

Precious Schorl—tourmaline.

Precious Serpentine—serpentine of rich oil-green color, translucent.

Precious Spinel—spinel, transparent, colorless to light shades of red, green or blue.

Prehnite—orthorhombic, usually reniform; green; hardness 6.5 to 6; specific gravity 2.95; silicate of calcium and aluminum with water. Gem names: **Cape Chrysolite**, **Chlorastrolite**, **Edelite**, **Green Agate**, **Green Star Stone**, **Greenstone**, **Isle of Royal Greenstone**, **Lake Superior Greenstone**, **Turtle Back**, **Zonochlorite**.

Prismatic Moonstone—quartz, chaledony, clouded.

Prismatic Quartz—cordierite.

Prismatine—kornerupine.

Prosopite—monoctlinie, usually massive to granular; colorless to pale colored; hardness 4.5; specific gravity 2.9; fluoride of aluminum and calcium.

Pseudochrysolite—moldavite.

Pseudodiamond—quartz, rock crystal.

Pseudoemerald—malachite.

Punamu Stone—jade.

Pycnite—topaz, very compact

Pyrite—isometric, usually in pyritohedra; brassy yellow; hardness 6 to 6.5; specific gravity 5.0; sulphide of iron; names used with ornamental varieties: **Alpine Diamond**, **Fool's Gold**, **Inca Stone**, **Pennsylvania Diamond**, **Sulphur Diamond**.

Pyro-emerald—fluorite, chlorophane.

Pyrope—member of the garnet group of silicates; isometric, usually in dodecahedra; hardness 6.5 to 7.5; specific gravity 3.70; red; silicate of magnesium and aluminum; gem names: **Adelaide Ruby**, **American Ruby**, **Arizona Ruby**, **Arizona Spinel**, **Bohemian Garnet**, **Bohemian Ruby**, **California Ruby**, **Cape Ruby**, **Colorado Ruby**, **Elie Ruby**, **Fashoda Garnet**, **Montana Ruby**, **Pyropene Garnet**, **Rhodolite**, **Rock Ruby**, **Rocky Mountain Ruby**, **Roselite**, **Rubino di rocca**.

Pyropene Garnet—pyrope.

THE SLUICE BOX

By A. RIFFLE

I remember when the stamp collectors had only monthly magazines. Then they blossomed out with weeklies; and I wouldn't be at all surprised to learn that they now have a daily.

For many years the mineral collectors struggled along without a magazine at all. Finally our Editor gave us this splendid quarterly. Now he says that with some more support he will make ROCKS AND MINERALS a monthly. You would put up quite an argument if some one tried to tell you that mineral collecting was not as interesting a hobby as any of the others. Let us show the country that our field is big enough and interesting enough to support a monthly. Remember! That if our quota of 5000 subscribers is reached, ROCKS AND MINERALS will not only come out monthly but the subscription price will not be advanced at all but will continue at \$1 per year. Just think!! This interesting magazine coming out every month—without an increase in its subscription price! Of course we want it to come out monthly and how can we assist? Why, rustling a few extra subscriptions will turn the

trick. If the Editor has nerve enough to tackle publishing the magazine monthly surely we should show spirit enough to support him in the venture. Pledge yourself right now to get the few subscriptions so our quota may be reached. Then we can go into the next winter with a monthly magazine and feel that we have put our hobby in a position where it rightfully belongs.

"Old Bill" pulls off a real wise crack once in awhile. Where he gets them I don't know but most of them are good.

A few days ago a young motor car salesman approached him in an effort to sell him a car. When it finally dawned on "Old Bill" what the young man was trying to do he dismissed him with this one: "Say, Mister, I ain't got no more use for an automobile than a jack rabbit has for a side car."

P. S.—Don't forget those extra subscriptions.

We wonder how many of our subscribers noticed that the March issue contained four extra pages?

Arandisite, a new tin mineral from a tin mine near Arandis, South West Africa, was reported and described by F. C. Partridge, M. Sc., before the Geological Survey of South Africa, December 17, 1929. It appears to be a silicate of tin.

M. Mawby, of Broken Hill, N. S. W., Australia, visited Sydney and some of the mining regions on the coast during his vacation recently.

The largest number of subscriptions sent in at one time by a member was 15. We hope this record may be passed during our drive for a monthly.

Interested members desiring to learn how our drive for a monthly is progressing may write in at any time, enclosing a self-addressed stamped envelope or card, and we will be glad to give them the latest figures.

The Spokane Washington Public Museum recently received, by exchange, a number of fine minerals from W. J. Paquette, of Toledo, Ohio.

WITH OUR MEMBERS

Two of our Members, Duke Jackson, dealer in Precious and Semi-Precious stones, of Hoquiam, Wash., and Robert H. Peel, dealer in Minerals and Gems, of Elmhurst, L. I., N. Y., have placed on the letterheads of their stationery the following inscription: Member, Rocks and Minerals Association.

We are pleased to have them note their membership so prominently and we would suggest to our other members, both dealers and collectors, that they do likewise for this would not only bring recognition and prestige to our Association but would advertise it also.

A. Boswell, R2, Reno Nevada, wishes to organize a Rocks and Minerals club in his city and would be glad to hear from all collectors living in his vicinity who may be interested in joining. The purpose of the club would be to interest

members in minerals and to improve their knowledge in the subject. Mr. Boswell believes the club would grow and prosper as there are so many prospectors and miners in his city to draw from. We would urge all our members in his vicinity to get in touch with Mr. Boswell and give him their interest and support.

Alan Thatcher of Upper Montclair, N. J., and one of our younger members, was recently elected President of the mineral club sponsored by the Newark Museum Association, Newark, N. J. A ten weeks course in minerals, given by the Museum, ended with a test and prizes were awarded to the winners. Young Thatcher won 1st prize and Clarkson Moreland, another of our young members, won the 5th prize. We are pleased with the showing made by our two members.

COMMENT AND CRITICISM

To the Editor of "R. & M":

We are indeed pleased with the results which we are getting from advertising in ROCKS AND MINERALS and as you will note we have ordered double space for the June issue. We would be glad to have thirty-six (36) copies of this issue to place on our counters here at the store. You may consider this letter as an order for the copies and charge the same to us.

Last Summer we made a practice of having three or four copies of ROCKS AND MINERALS on our display counter. Most of these we gave away to our friends. We consider it good advertising, not only for ourselves but for the magazine as well and we have been greatly pleased to note among the new members listed for the past year several to whom we had given copies of ROCKS AND MINERALS and we hope during the balance of the year to help you out much more.

Maine Mineral Store,
STANLEY I. PERHAM, Prop.,
West Paris, Me.

To the Editor of "R. and M":

Please permit me to take this occasion to tell you that I like ROCKS AND MINERALS very much for it is a most interesting magazine. I think "Little Journeys" is my favorite department and would like to read more of them, particularly of recent date. This may be because my wife and I have taken so many "little journeys" during the past year—some were successful, others not so much. For instance, we made one trip of eight miles that netted us some superb samples of manganese ore with enough left over for exchanging. Then again, just before Christmas, we drove 365 miles in a snow storm over the Great Smoky Mountains and got—three very small and poor specimens of corundum.

Others must have had similar experiences. Couldn't we hear from some of them?

ALBERT F. MAINLAND,
New York, N. Y.

THE ROCKS AND MINERALS ASSOCIATION

PEEKSKILL, N. Y., U. S. A.

Organized to stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not as yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

OFFICERS FOR 1930

Honorary President

Dr. Henry C. Dake, 793½ Thurman St., Portland, Ore.

Honorary Vice-Presidents

Dr. W. F. Foshag, Curator, U. S. National Museum, Washington, D. C.

Dr. L. J. Spence, Keeper of Minerals, British Museum, London, England.

Dr. Bertha Chapman Cady, Girl Scouts, Inc., 670 Lexington Ave., New York, N. Y.

Charles W. Hoadley, Englewood, N. J.

Morrell G. Biernbaum, 4301 Chestnut St., Philadelphia, Pa.

Gilbert Hart, St. Edwards University, Austin, Texas.

Noyes B. Livingston, 1605 Virginia Place, Fort Worth, Texas.

Benjamin T. Diamond, M. A., 467 Riverside Ave., Brooklyn, N. Y.

M. Mawby, 330 Chloride St., Broken Hill, N. S. W., Australia.

Edward Cahen, Birds Fountain, Dunsford, Exeter, Devonshire, England.

Secretary-Treasurer

Peter Zodae, Peekskill, N. Y.

If you are not a member of the *Rocks and Minerals Association* you are cordially invited to join.

MINERAL LOCALITIES INFORMATION DEPARTMENT

Members desiring information regarding minerals or mineral localities in the following states may obtain it by writing to the Collectors listed and enclosing a self-addressed stamped envelope.

THE NORTHWEST—Washington, Idaho, Montana, Oregon and parts of British Columbia { Charles O. Fernquist, Curator of Mineralogy, Public Museum, 2316 First Avenue, Spokane, Wash.

Oregon, Southern Idaho, Northern Nevada { Dr. Henry C. Dake, 793½ Thurman Street, Portland, Ore.

The Oregon Coast, South and Western Oregon, Northern California, Southern Washington { John M. Tracy, 601 Orange Street, Portland, Ore.

Petrological Information in Central Eastern Iowa { Prof. Wm. J. H. Knappe, Curator, Wartburg College Museum, Clinton, Iowa.

THE PRESIDENT'S PAGE

MAKE OUR MAGAZINE A MONTHLY

BY DR. HENRY C. DAKE

Some time past the editor called for an expression from the members of the Rocks and Minerals Association relative to publishing our official magazine monthly instead of quarterly. At that time about five hundred replies, with pledges, were received, to support the publication of ROCKS AND MINERALS on a monthly basis. However, due to the fact that the magazine was still in the "red" and that the response was not sufficient, it was decided to follow the most conservative course and wait until our membership made a substantial gain.

Rocks and Minerals Association has in the past few months gained a large number of new members and is now we believe, by far, the largest mineralogical association in the world. We have nearly two thousand paid up members and readers in all parts of the world. This rapid growth is due to a new interest being shown in the collection and study of minerals and to the cooperation and help of our members and dealers in minerals.

It is the firm belief of the officers of the Association that the progress of our organization would be enhanced if our magazine were printed monthly. This belief is based largely upon the many letters being constantly received from the members, urging that we publish monthly.

When publication of ROCKS AND MINERALS was first started, some years past, with only a small subscription list, the editor advanced sums of money to carry printing and other costs. Due to the fact that he has not received any pecuniary renumeration for this work it seems unjust to call upon him to advance further money to guarantee the costs of a monthly publication. It has been determined that

the subscription need not be raised from the present charge of one dollar per year if each of our present members will pledge themselves to secure or pay for three or four subscriptions so our quota of 5000 members may be reached (as per announcement appearing on another page in this issue). This arrangement will not work a hardship on anyone and will not be permanent as we have the prospects of securing advertising from some of the large National advertisers as soon as the magazine is printed monthly. It is the belief of the officers that with an increased membership and the magazine appearing monthly, enough new advertising can be secured to pay for a substantial increase in the space devoted to reading matter. Arrangements are being made to add new writers to our staff, who will contribute technical as well as popular articles, some of which will be contributions to the science of mineralogy.

Monthly publication can be started in six months if proper response is received from the members. Without this response and help it will be necessary to wait until a large enough sinking fund has accumulated, which will possibly require two years.

Judging by the large number of letters received by the officers of the Association, the magazine fills a want that is probably not covered by any other mineralogical publication and with this in mind it seems imperative that the same be printed monthly. The plan for carrying out this program will certainly not work a hardship on anyone and the benefits to each member are obvious. We ask that you sign the pledge for whatever number of members you feel you can secure.

MEMBERSHIP DEPARTMENT

New Members Enrolled—Jan. 20, 1930—April 20, 1930
Total Membership 1548

THE HONOR ROLL

New Members Secured since January 1st, 1930, by:

The Gem Shop, Wolf Creek Mont.....	26
Ward's Natural Science Est., Rochester, N. Y.....	18
Noyes B. Livingston, Fort Worth, Texas.....	5

ARIZONA

Parker—Watson, James C.

ALASKA

Ketchikan—Beek, Geo. V.

CALIFORNIA

Alhambra—Chapman, E. W.

Bakersfield—Krammes, Miss Kathryn Osborne, Mrs. Priscilla

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Carmel—Wyekoff, Joseph

Claremont—Laudermilk, Jerome D. Yaeckel, Peter

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Turney, Dayton

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Saugus—Cooper, Phil

Triniti—Frazier, Allen W.

Whittier—Hewitt, Charles A.

Wilmington—Compton, Hugh

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Dayton—Semmelman, Jack
Warren—Barker, Miss Mary B.

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Hall, Jerry
Johnson, Miss Louise
Litchfield, Jr., Lawrence

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TENNESSEE

Kingsport—East Tenn. Mineral Co., Inc.
TEXAS

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Houston—Haddon, Parham
Plainview—Smith, C. L.
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Newfane—Stewart, Miss Florence T.
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Johnson, Charles P.
Lander—Russell, Miss Marian
Lusk—Brown, H. C.

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CUBA

Havana—Alareon, M. R.

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The following Rules must be observed:

- 1—Minerals for exchange must be of good quality.
- 2—Label them plainly—in ink—name of mineral and place where found.
- 3—Have a list made of what you can supply—describing each mineral.
- 4—Send a copy of your list to the collector with whom you wish to exchange and wait for a reply containing his list.
- 5—Pick the minerals off his list you want and so write him. In this way some arrangement can be made that will be pleasing to both.

CALIFORNIA

Robert Hoover (B), Route 1, Modesto.

H. Goudey, (B), 225 Montgomery St., San Francisco.**MISSOURI**

Fred. H. Pough (A), 4 Lenox Pl., St. Louis.

NORTH CAROLINA

Fred M. Allen, (B), Box 185, Gastonia

TEXAS

C. L. Brock (M), P. O. Box 1492, Houston.

WASHINGTON

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WYOMING

Ruel B. Triplett (B), Burntfork

ROME (Italy)

Roberto Palumbo (A), 2 Via Fracastoro.

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